ANGLIA RUSKIN UNIVERSITY

FACULTY OF SCIENCE AND ENGINEERING

AUTHENTIC ASSESSMENT TO ENHANCE UNDERGRADUATES' LEARNING AND DEVELOPMENT AS EFFECTIVE PRACTITIONERS IN BUILT ENVIRONMENT DISCIPLINES

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A thesis in partial fulfilment of the requirements of Anglia Ruskin University for the degree of DProf Engineering and the Built Environment

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FACULTY OF SCIENCE AND ENGINEERING

PROFESSIONAL DOCTORATE (BUILT ENVIRONMENT)

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Purpose
Assessment feedback is an important contributor to student learning, yet research shows that built environment students are the least satisfied in respect of feedback and reasons for this are not fully understood. Further, recent research shows that built environment students are not always as well prepared for industry as employers' desire. This work explores means by which use of authentic assessment, allied with assessment feedback, contributes to resolving both of these problems.

Research design
The research takes an anti-positivist and interpretive epistemology. The methodology used comparative case studies to generate ideas for modifications to practice in action research, in which assessment was modified to be more authentic to professional practice. Data were gathered from documents, focus groups with students, and interviews with tutors and employers throughout the cycles of action research.

Findings
Findings suggest that authentic assessment, allied with feedback, may provide an enhanced learning experience for built environment undergraduates. Professional practice activities incorporated within assessment exposed students to practice-based real-world activities and challenges, thereby supporting their development and better equipping them for industry. Further, assessment design influenced feedback design, which correlated with students' perception and understanding of their feedback.

Conclusions
Authentic assessment, allied with assessment feedback, supported student learning effectively and helped prepare students for industry through exposure to real-world activities and challenges. Making assessment more authentic to professional practice, and allied with assessment feedback, provided an enhanced learning experience for built environment undergraduates. Developed from this research, the thesis provides a toolkit for tutors to support their design of authentic assessment and allied feedback. The contribution to knowledge of this thesis is, first, the contribution to theory concerning assessment authenticity in relation to professional practice for built environment undergraduates, and, second, the contribution to practice through production of a tutors' toolkit.

Key words: authentic assessment: built environment; feedback; learning; professional practice; undergraduates.

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Copyright declaration

List of Abbreviations

APC	Assessment of Professional Competence
ARB	Architects Registration Board
ARU	Anglia Ruskin University
BA (Hons)	Bachelor of Arts honours degree
BOptom (Hons)	Bachelor of Optometry honours degree
BSc (Hons)	Bachelor of Science honours degree
CBI	Confederation of British Industry
CIAT	Chartered Institute of Architectural Technologists
CIOB	Chartered Institute of Building
CSF	Course Specification Form
CSFS	Chartered Society of Forensic Sciences
DProf	Professional Doctorate
FdSc	Foundation degree
GOC	General Optical Council
HE	Higher education
HEI	Higher Education Institution
ILO	Intended Learning Outcome

JBM	Joint Board of Moderators
LO	Learning Outcome
MES	Module Evaluation Survey
NUS	National Union of Students
OSCE	Objective Structured Clinical Examination
PSRB	Professional, Statutory and Regulatory Body
Px	Optometry shorthand for patient
QAA	The Quality Assurance Agency for Higher Education
RICS	Royal Institution of Chartered Surveyors
UK	United Kingdom

Chapter 1 Introduction to this Thesis

1.1 Introduction

1.1.1 The starting point for this research - the problem

Assessment forms the focus of students' learning activities (Boud and Falchikov, 2007). Feedback on assessment tasks is a crucial element of students' learning experience (Evans, 2013) and their development as practitioners (Eraut, 2006). Yet tutors in the Department of Engineering and the Built Environment (the Department) at Anglia Ruskin University (ARU), and at many similar departments in other Higher Education Institutions (HEIs), grapple with the problem that built environment undergraduates' frequently evaluate assessment feedback as being the weakest part of their learning experience. This is evidenced through the National Student Survey (NSS). Reasons for this phenomenon are not fully understood. Producing this work was driven by the need to respond to this problem within the Department. Preliminary work undertaken during Stage One of this DProf found that written feedback did not explicitly link students' work with professional practice. This is important because the courses under investigation seek to prepare students as built environment practitioners, and references to professional practice activities should, therefore, be prevalent. In response to this situation, this research examines the gap in knowledge concerning assessment and allied assessment feedback for built environment undergraduates in relation to their professional practice development; this is both theoretically driven and practice-based. It is, therefore, necessary to undertake this study at doctoral level.

1.1.2 The researcher

I have taught undergraduate and postgraduate students in the Department for a number of years and always found my subject – economics - exciting, relevant and current. It is a dynamic field and there are always things to discuss with students which relate to or would be of relevance to practitioners in their industry. Students evaluated my classes as interesting yet they did not perceive the subject as relevant; although understandable, this was an error on their part I felt! It can be inferred from this that they preferred subjects which could be immediately applied in the workplace, and this seemed particularly true for part-time day-release students studying in the Department.

Yet I also perceived that in some ways I was remote from courses in the Department – I was not a surveyor, construction manager, architect or civil engineer. I did not know a

great deal about the industry and considered this a gap in my knowledge. Consequently, I decided to undertake an MA by Independent Study at the University of East London. During this course, following a research methods module, learners designed their own package of learning and assessment. This was presented in the form of a detailed proposal which had to be submitted and formally approved by the university before the student proceeded onto the second stage of the course. I wanted to undertake a piece of work which would allow me to develop my interests in education and in the built environment. I decided to undertake research evaluating the links between philosophy of education and architecture with reference to primary schools. Producing this dissertation was fascinating and additionally I developed insight into aspects of the built environment which were helpful in my employment.

During this time I took on new responsibilities in the Department which included overseeing the assessment process. Amongst other things, I was tasked with ensuring that assessment protocols worked effectively and that quality was maintained. We internally reviewed exam papers, suggesting modifications as deemed necessary for improvement prior to sending them, with coursework briefs, to our external examiners for review and comment. Subsequently, the examiners visited the university to attend the Department Assessment Panel, which was the university protocol for reviewing and approving the marks as appropriate. During their visits, examiners reviewed students' marked work and the feedback provided, and commented on these and also the assessment briefs. These activities provided the basis of information to inform the examiners production of their annual report. My role was time-consuming but it was satisfying to read our external examiners reports which confirmed that we provided an effective service, supporting students' learning through the assessment and feedback process. I also deduced that employers were satisfied with the learning experience we provided as they continued to send their employees to study in the Department. We continued to hold Professional, Statutory and Regulatory Body (PSRB) accreditation as the professional bodies were satisfied with our educational provision. We were, it seemed, effective in our provision of accredited undergraduate courses.

I also took on the responsibility for producing the teaching timetable for the Department and quickly came to regard the teaching timetable as more than an administrative task. It is part of the learning environment which has a fundamental effect on students' learning experience and the quality of their working week. I took great care to ensure that, within the constraints of course design and available resources, the best possible arrangements were made for students, avoiding scheduling classes late in the evening

or giving students long gaps between classes during their day at university. For the students who commuted long distances to get to university, these were measures that improved their learning experience.

Starting in 2015, ARU required tutors to provide word-processed feedback for students, something I did not enjoy because my limited keyboard skills had the effect of slowing my production of feedback. More significantly, this word-processed feedback did not change the academic results or student evaluations of my classes. I reflected on the on-going problems concerning assessment feedback and the fact that despite our best efforts they remained unresolved.

I decided that I should develop my work and contribute further improvements to the student experience, which was my passion. I began to consider how the student experience could be enhanced. Consequently, I decided to embark on this DProf, and conduct a thorough examination of assessment feedback. In Stage One of this DProf I had to produce three papers, the third of which was to include some data gathering and analysis. For that third paper, I decided to analyse feedback produced for students in the Department. Having first secured ethics approval, I gathered 43 items of marked work, with feedback, which students had not collected from the university. This represented approximately 4.7% of all submissions in the Department, almost all of which were paper submissions and only one module used the internet-based Turnitin for submission. It was recognised that this was a small sample, and was one of convenience (Gray, 2014). Analysis of this assessment feedback proved curious; nothing new was to be found which was not already in literature concerning feedback. Yet the student evaluations identified a problem. As a last resort I went ‘back to basics’. I had already analysed feedback and found nothing new, so I decided to explore whether anything of interest was missing from the feedback. Findings revealed that feedback contained no explicit reference to professional practice. The feedback mostly concerned academic issues of students’ work in relation to the brief. This took my research in a new direction; it became an exploration of the professional practice dimension of assessment and assessment feedback, the latter being evaluated by students as in need of improvement.

1.1.3 The need for this research

Results of ARU student surveys suggested there was room for improvement in the Department’s provision of assessment feedback (Carter and Priddle, 2012). Further,

ARU built environment undergraduates' evaluations of their course in the National Student Survey (NSS) echoed this theme. In 2013, assessment and assessment feedback were evaluated as low scoring compared with all other areas in the survey. For example on the BSc (Hons) Construction Management, only 57% of ARU students agreed with the statement "feedback on my work has helped me clarify things I did not understand" (UNISTATS, 2013), which suggests that 43% of students either did not find feedback helpful or had no opinion. The BSc (Hons) Building Surveying course achieved 65% satisfaction with regards to this statement and 61% in respect of feedback on students' work being prompt (UNISTATS, 2014). It was also recognised that the problem extended to assessment as well as assessment feedback, heightening the necessity of finding solutions. From ARU data, the annual Head of Department report deemed there was a need to "identify clear measurable targets for improving assessment and feedback across the Department" (Crabtree, 2013, p.22). It remained a concern within the Department that there were issues regarding "timely and detailed feedback and also that feedback has [not] helped students clarify things that they did not previously understand" (Fenton and Jones, 2016, p.25). Therefore, there was a clear need to improve this situation for the benefit of undergraduates, the Department and industry.

Intriguingly, external examiners reports found that the Department produced "effective learner feedback" (Roberts, 2012, p.5). As student surveys consistently contradicted this finding, it was possible that at least part of the problem was a gap between perspectives of academics and examiners, and those of students. There were some possible causes of this: the feedback provided was not applicable to students' learning needs; students were not feedback literate; or, that feedback was not recognised or understood as such by students. Alternatively students' needs may not have been met through the summative feedback on written work but and instead they may have preferred feedback on drafts of their work yet not defined this as feedback. Feedback is important for learning (Hattie and Timperley, 2007) and there was clearly scope identify the cause of the problem in the Department and offer potential solutions. This was, therefore, worthy of investigation.

It must be noted here that the Department's continued PSRB recognition acknowledges its ability to offer a valuable high-quality learning experience. Tutors in the Department spend a great deal of time and effort designing assessment and providing assessment feedback for students, before and after submission of assessed work, and written and verbal. They provide summative feedback within the university

timescale of 20 working days from the submission deadline and 30 working days for dissertations/major projects, and strive to provide students with the best possible learning experience. The goal of this work is to enhance the student experience with regards to assessment and assessment feedback, which have been identified as having potential for improvement in the Department and, indeed, in built environment undergraduate courses across the higher education sector.

1.1.4 Problems

The foregoing implies a number of interlinked problems surrounding assessment and assessment feedback, some of which were identified at ARU and some from literature, as follows.

- Student surveys at ARU identified the need for assessment feedback within the Department to better meet students' learning needs (Carter and Priddle, 2012).
- Preliminary research in Stage One of this DProf found that assessment feedback made no reference to professional practice, thereby limiting opportunities to prepare students for industry.
- It was known that a significant proportion of undergraduates in the Department did not collect their marked work which contained summative assessment feedback. This limits their opportunities for further learning.
- Literature reveals that across the Higher Education (HE) sector, in the NSS "architecture, building and planning students are least satisfied with the assessment questions" (HEFCE, 2014, p.46).
- Built environment students express concern regarding their personal development, acquiring confidence and being intellectually challenged in their course (Lamond, Proverbs and Wood, 2013).
- There is a concern, expressed by the Chartered Institute of Building (CIOB), that 34% of construction employers felt graduates had not developed appropriate skills for industry. These missing skills are defined by industry as personal and work experience skills, rather than curriculum based skills (Rawlins and Marasini, 2011).
- It is recognised that built environment graduates often lack practice-based competencies and so present challenges to their employer: they need support to achieve the necessary degree of competence; they are not as efficient as necessary in respect of their earning capacity; and,

they may be at increased risk of professional error (Quarterman, 2017). This is all the more interesting as employers, acting as external examiners, review coursework briefs and have expressed no cause for concern.

- ❖ Built environment graduates competencies fall short of employers' expectations (Witt, et al., 2013).
- ❖ 65% of employers expressed a desire for employability skills of students in all industries to be better developed (CBI, 2012).

These issues highlight the problem that built environment courses do not always prepare students for industry as well as might be desired. Combined with this was the problem that students in the Department evaluated their experience as having weakness in the provision of assessment feedback. The Department is clearly not the exception to this, as NSS data show. This study is concerned with assessment and assessment feedback for built environment undergraduates in the Department.

1.1.5 Gaps in knowledge

The above problems suggest that the students' learning experience could be enhanced to better meet their learning needs and their preparation for industry. There is relatively extensive literature concerning assessment and assessment feedback (see for example Sadler, 1998; Prosser and Trigwell, 1999; Biggs, 2003; Stiggins and Chappuis, 2005; Carless, 2006; Nicol and Macfarlane-Dick, 2006; Boud and Falchikov, 2007; Hattie and Timperley, 2007; Evans, 2013). Some attention has been paid to assessment and assessment feedback in specific settings. For example, Adcroft (2010) examined assessment and feedback in a school of law; Carter, et al. (2015) explored authentic assessment within undergraduate midwifery education; Speers and Lathlean (2015) examined service user involvement in giving mental health students feedback on their placement. However, little attention has been paid to built environment courses. There is a Professional Doctorate in Education thesis concerned with assessment feedback in built environment courses (Dunster, 2009), but this does not consider assessment or development of students' professional practice skills. There is a Professional Doctorate which considers employability skills and curricula (Hampton, 2016), but this focused on revisions to curriculum rather than to assessment and assessment feedback. There exists a paper concerning built environment feedback practice (Mulliner and Tucker, 2017), but that paper is concerned only with students' and tutors' perceptions of feedback, and does not include assessment or professional

practice. The following keyword searches were made of Scopus as follows: ‘construction undergraduate’; ‘professional construction student’; ‘professional construction undergraduate feedback’. The number of items revealed were 260, 257 and one respectively. No items considered how assessment could be made more authentic to professional practice and, allied with feedback, enhance the built environment undergraduate learning experience.

A number of gaps in knowledge were apparent. They included the following.

- It was not fully understood why built environment courses – in particular those covering property, surveying and construction disciplines - are on average evaluated with lower levels of satisfaction than other subjects, although there are “large differences between built environment and all courses relate to detail, clarity and fairness” (Lamond, Proverbs and Wood, 2013, p.8).
- There was a dearth of research into the learning needs of built environment students’ with regard to assessment and assessment feedback.
- It was not fully understood how to design assessment that develops built environment students’ knowledge and skills in preparation for professional practice.
- It was not fully understood how to support built environment undergraduates learning and development (Witt, et al., 2013).

To summarise, there was a lack of research concerning the effect to which assessment and assessment feedback could be constructively aligned with professional practice for Built Environment undergraduates to enhance their learning experience.

1.2 Context

1.2.1 The expansion and accountability of higher education

Over the last 50 years, the UKs Higher Education system has expanded from an exclusive to a mass system, with a high-quality learning experience provided at a low cost (Salmi, 2011). The HE sector operates within the Bologna Declaration 1999 (Gänzle, Meister and King, 2009), whereby HEIs in signatory nations offer degrees of a comparable standard. In the UK, competition between institutions is also a feature of the HE landscape, offering student ‘choice’ in a quasi-market (Callender and

Dougherty, 2018). In the academic year 2016/17, there were 1.76 million undergraduates in the UK (Universities UK, 2018). One rationale for this expansion of higher education is economic growth (De Meulemeester and Rochat, 1995; Whiteley, 2012) and the enhanced national competitiveness through investment in human capital (Clegg, Kornberger and Pitsis, 2011) as it is known that skills developed in higher education make an important contribution to a healthy economy (Smith, et al., 2012). The current level of economic and political uncertainty mean that such investment is all the more valuable to help the UK maintain its competitiveness and it is important that the Department contributes effectively to achieving this goal. Indeed, providing skilled graduates who effectively meet the needs of industry and thus contribute to a healthy economy is one important function of higher education (Leitch, 2006).

There has been some debate regarding the cost of higher education (Tatlow and Conlon, 2013). Delivering value for money whilst developing undergraduates as effective practitioners is a goal of accredited courses and is worthy of further examination. Given the role of higher education as a contributor to the competitiveness and economic growth of the UK through investment in human capital, this highlights the importance of supporting students' knowledge and skills development for professional practice. It is worth noting that there is a tension between employers and HEIs, the former having a preference for training and skills development and the latter for education and knowledge (Cotgrave and Kokkarinen, 2010). This suggests that there is scope for HEIs to enhance the service provided to better meet students' and employers' needs.

The year 2005 saw the introduction of the NSS, administered by the market researchers Ipsos MORI (HEFCE, 2014). The NSS is a survey of largely final-year undergraduates (The National Student Survey, 2018). The NSS is intended to "contribute to public accountability, help inform the choices of prospective students and provide data that assists institutions in enhancing the student experience" (HEFCE, 2014). NSS results are publicly available and provide comparative data regarding institutions (The National Student Survey, 2018).

The NSS contains 22 questions which are divided into seven areas: teaching and learning; assessment and feedback; academic support; organisation and management of programmes; learning resources; personal development; and, overall satisfaction. Responses are on a five-point Likert scale from "definitely agree" to "definitely disagree", and a "not applicable" option is included (HEFCE, 2014). Section two of the

survey, probes issues surrounding assessment and assessment feedback. Until 2016 NSS statements concerning assessment and feedback were as follows:

- The criteria used in marking have been clear in advance
- Assessment arrangements and marking have been fair
- Feedback on my work has been prompt
- I have received detailed comments on my work
- Feedback on my work has helped me clarify things I did not understand

(HEFCE, 2016b).

Beginning in 2017 revised NSS statements concerning assessment and feedback were as follows:

- The criteria used in marking have been clear in advance
- Marking and assessment has been fair
- Feedback on my work has been timely
- I have received helpful comments on my work

(HEFCE, 2016c).

However, although there are beneficial aspects of this survey, arguably it is flawed in one key area; different institutions possess different student populations (Brown and Lauder, 2010) and different groups of students place different value on what may be considered excellent teaching (Kuzmanovic, et al., 2013). Therefore, using survey data to make comparisons between HEIs is not as straightforward as might initially be thought, and informed choice may be more difficult to realise than is supposed. In spite of this, and in response to publication of aggregated NSS data, institutions have been motivated to implement policies that may enhance students' evaluations (Pickford, 2013). At ARU an institution-wide policy was introduced which expected word processed bespoke feedback to be provided for students within a given timeframe, 20 working days for all undergraduate submissions and 30 working days for dissertations. It is worth noting that institutional feedback policies may not necessarily produce desired results (Bailey and Garner, 2010). Such policies may encourage a degree of promptness, or a particular structure, content or format for feedback. However, they do not address issues regarding quality of feedback or, importantly, the nature of the student – tutor dialogue (Higgins, Hartley and Skelton, 2001) with its value to support learning or indeed whether students read their feedback. Ultimately, it is possible that staff may regard feedback as an administrative chore, a requirement to comply with regulations (Hounsell, 2007), rather than deploying the pedagogic value of feedback (Hyatt, 2005). Therefore, finding routes to use assessment and assessment feedback

more effectively to support students' academic development and also their development as practitioners would enhance the work of the Department to better meet students' learning needs. Formative feedback (Chapter 2) in particular may be useful to students as it supports their learning during the learning phase of module delivery and allows them to improve their work prior to submission. It is also feasible that use of such effective feedback may impinge positively on students' NSS evaluations.

Tutors in the Department worked hard to meet institutional marking and feedback requirements in order that results could be processed and made available to students by published deadlines. Many tutors believed that this summative feedback arrived too late to be of use in the module to which it related and that consequently was little used by students (Chapter 7). Students reported that use of formative feedback was more mixed (Chapter 8, Section 8.2). Nevertheless, tutors worked hard to meet deadlines, producing feedback which would be useful to students and support their learning. External examiner reports concurred that the feedback provided was of value to students (Roberts, 2012).

The NSS does not ask questions in relation to assessment design. Nor does it investigate whether assessment prepares students for professional practice or develops their professional or employability skills. This means that students would have to express any opinion they may have in this regard in the free-text section of the questionnaire or via other means such as student liaison committees. Consequently, stakeholders have little information regarding how they may better prepare students for industry.

Employers value academic qualifications, and express a desire for undergraduate curricula to reflect their professional practice needs (Hoxley and Wilkinson, 2006). However, academic qualifications are not necessarily a guide to professional competence. Becoming a "professional practitioner is highly complex" (Doel, Sawdon and Morrison, 2002, p.17), requiring individuals to develop a range of knowledge and skills, and presents a challenge for the Department to support students develop that knowledge and skills. The Confederation of British Industry found employers made 80% of any recruitment decision on the basis of perceived employability or soft skills (CBI, 2007). Both the Confederation of British Industry (CBI, 2012) and the Department for Business, Innovation and Skills (2012) identify the need to further develop graduates' employability skills to better meet the needs of industry. Therefore, given that an important function of HE is preparing graduates for industry, tutors in the

Department should consider how they help students develop these skills (Bates and Kaye, 2014) in addition to their technical subject knowledge. Assessment offers one potential route to achieving this goal, as it provides the focus for students learning activities.

1.2.2 Employability

Employability is defined by the Higher Education Academy (now part of Advance HE) as “knowledge, skills, experiences, behaviours, attributes, achievements and attitudes to enable graduates to make successful transitions and contributions, benefitting them, the economy and their communities. Employability is relevant to all students” (Higher Education Academy, 2015). The Confederation of British Industry (CBI) and the National Union of Students (NUS) identify these skills and place positive attitude at their centre (Figure 1.1). Employability skills are not profession specific and are valued by employers in a wide range of occupations. By contrast, hard skills are those which are specific to a particular occupation; measurement, for example, is a skill specific to quantity surveyors.

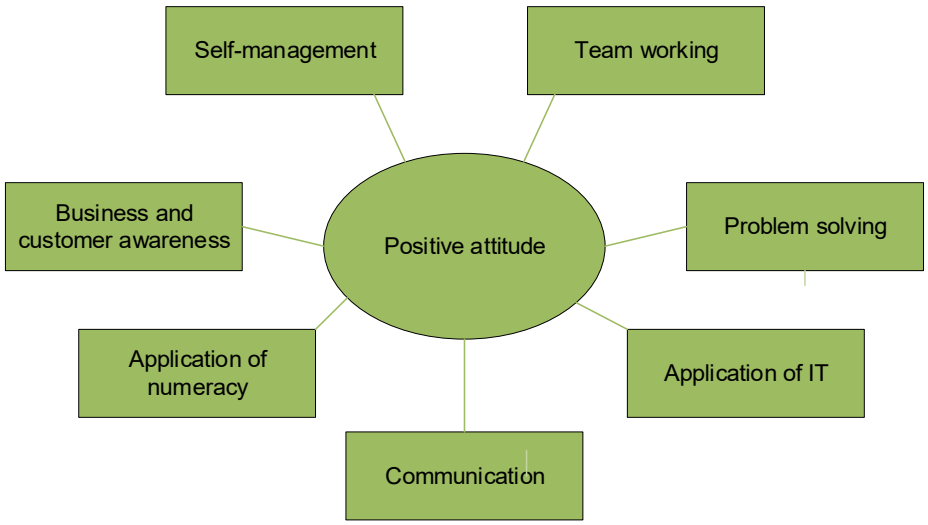

Figure 1.1 Employability skills (CBI/NUS, 2011)

Developing students’ employability skills has been recognised as valuable (Knight and Yorke, 2003). In some professionally recognised courses, for example nursing, employability skills and competency development are embedded within course design (Wu, Heng and Wang, 2015). However, in accredited built environment courses, such development remains more opaque. Therefore, in relation to the use of assessment which is authentic to professional practice and allied with assessment feedback, this

research seeks to understand how to improve current knowledge and practice (Basit, 2010) to enhance built environment undergraduates' learning experience. This includes development of hard skills and employability skills.

In professionally recognised courses, developing students' employability and professional practice skills is of vital importance if HEIs are to fulfil one of their key functions, that of contributing to a healthy economy (Leitch, 2006). Yet only half of all undergraduates' feel they have developed effective career skills (Neves, 2016), implying scope for HEIs to enhance the learning experience provided. There is a gap between skills students think are their best and those that are most valued by employers (DuPre and Williams, 2011). Employers often express concern regarding undergraduates' limited employability skills (CBI, 2012) and in particular, commercial awareness is an area where employers often find graduates under-prepared (Poon and Brownlow, 2015). Further, employers remain uncertain about the ability of institutions to effectively develop these skills in students (Low, et al., 2016). Therefore, this suggests there is potential for HEIs to add value to their students learning, helping students to integrate theory and practice (Freudenberg, Brimble and Vyvyan, 2010) and supporting their development as industry practitioners. The challenge for HEIs surrounds how to best achieve this goal.

Students express concern for how their course will prepare them for their life in professional practice (Voss, Gruber and Szmigin, 2007). However, unlike employers, their particular concern is with employment opportunities (Kandiko and Mawer, 2013). Thus, it can be seen that expectations both of employers and of students converge around theoretical knowledge and development of employability skills. Yet it appears there is some divergence between desire and practice, as 65% of employers want HEIs to be better at developing undergraduates' employability skills (CBI, 2012).

1.2.3 The setting for this research

The Department is located on the Chelmsford campus of ARU and is within the Faculty of Science and Engineering (the Faculty). The comparative case studies used are located on the Cambridge campus of ARU. Buildings on the Chelmsford campus were all constructed since 1995 and are purpose-built. The Department is based in the Marconi building, which was constructed in 2008, and in addition to classrooms and a lecture theatre contains specialist IT classrooms, an architecture studio, an architects' model-making facility, a law court, and a civil engineering laboratory.

This work is concerned with undergraduate courses in the Department, and in order to provide a comparison to generate ideas for the action research and help provide a framework for analysis, two comparative case studies were chosen and data was gathered from these cases. The two areas for comparison were selected because they provided ample ideas to support modification to practice, and as accredited undergraduate courses within the Faculty were “relevant dimensions of comparison” (Flick, 2011, p.162). These courses were the BSc (Hons) Forensic Science and the BOptom (Hons) Optometry. Being in the same Faculty meant tutors on these courses as well as those in the Department were required to use the same Faculty module guide template and the same assessment protocols, thus providing a degree of similarity and so relevant comparison. Further, there was a degree of comparability with the Department as these courses were accredited and so had to meet their PSRB requirements while operating within the ARU framework. These particular courses were selected from all courses in the Faculty because they prepared students for employment as professionals in a particular industry, which was similar to courses in the Department.

As of January 2018, there was a total of 860 undergraduates in the Department. Of these, 563 studied on a part-time basis and 297 on a full-time basis, meaning that part-time students represented 65% of the undergraduate population. The ratio of part-time to full-time students in the Department varied across the economic cycle. Forensic science had 162 full-time students plus three on sandwich placement in industry and optometry courses taught 170 full-time students. Neither of these comparison courses were available for study on a part-time basis.

The number of part-time undergraduates in the UK has declined by 58% since 2010/11 (HEFCE, 2016a), a trend not reflected in Australia or the USA despite their funding arrangements being similar to those in the UK (Lowe, 2016). This is all the more interesting given that higher education offers the opportunity of enhanced earnings and also non-pecuniary advantages such as status (Blanden, et al., 2010). Part-time higher education offers learners the opportunity to develop skills that are valuable in their employment (Callender and Little, 2015). Part-time students experience benefits and challenges of combining work and study - it offers alternative opportunities to learn and provides a context for learning (Shaw and Ogilvie, 2010). There is also the possibility of studying through a degree apprenticeship to combine work and part-time study, but in the Department this was not used during the period of this research.

The experience of part-time higher education has been recognised as valuable, as it offers opportunities to those who might otherwise find it difficult to engage in formal education (Department for Business, Innovation and Skills, 2011) and offers access to professions which for some students might be difficult to obtain otherwise (HEFCW, 2014). Part-time courses represent an important aspect of HE provision in the UK, opening avenues of opportunity for individuals, and through their up-skilling contributing to the economic prosperity of the UK (Universities UK, 2013).

It is worth noting that there can be difficulties for learners irrespective of the extent of their practice-based experience (Hasson, McKenna and Keeney, 2013). However, some students studying on a part-time basis experience tension between their employment and their course (Gibbs, Jones and Oosthuizen, 2013), suggesting they may have additional or different challenges from those who study on a full-time basis. This highlights a challenge facing tutors in the Department as they seek to provide undergraduates with an effective learning experience that develops their knowledge and skills, meeting the needs of all learners irrespective of their mode of study.

Part-time students in the Department possessed practice-based knowledge; other mostly full-time students had no such knowledge from which to draw. Part-time students in the Department attended classes one day per week during semester teaching time and for four days per week were employed in professional practice. Accommodating this diversity of learners remains a challenge. Little attention is given to how tacit knowledge of part-time students may be further developed (Bertram, Mthiyane and Mukeredzi, 2013). Conversely, full-time students in the Department often experienced challenges trying to understand and assimilate academic work concerned professional activities of which they had no knowledge or experience.

Built environment refers to “a range of practice-oriented subjects which are concerned with the design, development and management of buildings, spaces and places” (Griffiths, 2004, p.711). All built environment honours degree courses in the Department are accredited by the relevant PSRB. For example, surveying honours degrees are accredited by the Royal Institution of Chartered Surveyors (RICS). This is similar to built environment courses at other HEIs. There is also an accredited civil engineering foundation degree. There is one construction foundation degree which is not accredited but is designed to accommodate PSRB requirements of surveying and construction management honours courses. This is so that construction foundation

degree students may to transfer to an appropriate honours degree if they so choose and they have sufficient academic standing. Normally, over half of the construction foundation degree students elect to transfer to an honours degree. This means that all of the undergraduate courses in the Department are designed to accommodate PSRB requirements.

Built environment undergraduate courses in the Department seek to offer a learning experience that supports development of students' knowledge and skills required of practitioners. For example, the ARU web site advertises that the BA (Hons) Architecture "delivers the creative and technical skills you'll need to help transform our built environment and succeed in architectural practice" (Anglia Ruskin University, 2018a). The BSc (Hons) Quantity Surveying full-time course seeks to develop in graduates "a sound understanding of the demands of professional practice, including how to identify and meet clients' needs" (Anglia Ruskin University, 2018b). The BEng (Hons) Civil Engineering course advertises "Engineers work in professional practice, advising clients. Therefore, you'll learn a range of transferable skills, including how to manage projects and contracts; statistics; management techniques; and principles of IT. You'll become a creative problem solver and a confident communicator, able to work well independently and in a team" (Anglia Ruskin University, 2018c). This highlights the practice-based nature of courses in the Department, and the focus on preparing students for industry as professional practitioners.

The question of curricular design and delivery is more complex than at first might be thought. It is possible there exists an ambiguity within HEIs, as tutors seek to demonstrate course credentials through the pursuit of formal academic knowledge rather than professional practice knowledge used in industry. It may be the case that such knowledge represents the focus of curricular design, teaching and assessment of undergraduates, and that as a result developing students' professional knowledge and skills receives less attention. However, further difficulties arise as even within a single built environment discipline there may be a wide range of employment and employers. For example, quantity surveyors may be employed to draw up Bills of Quantities for tenderers, oversee cost control of contractors' projects, represent clients' interests in a project or work in project management, and they may work for a range of employers from contractors to banks. Therefore, providing courses that develop undergraduates as effective professional practitioners for the construction industry is a challenge to which the Department should respond.

1.2.4 The industry

It is worth providing here an overview of the size and nature of the industry for which the Department prepares undergraduates. In 2015 the construction industry provided approximately 6.2% of the UK total economic output and 2.1 million jobs (Rhodes, 2015). In 2017 output of the construction industry was almost £164 billion (Statista, 2018). The industry contributes to growth of the UK capital stock (Myers, 2013). This illustrates the fact that the construction industry is important in the UK for standards of living, accumulation of capital and economic growth. Unlike some industries, the construction industry is highly dependent on the economic cycle (Ruddock, Kheir and Ruddock, 2014). This has consequences for the Department, as recruitment of undergraduates follows the economic cycle. Therefore, to remain competitive in the higher education market, it is important that the Department provides courses which effectively meet the needs of students and employers.

The construction industry contains a disparate range of projects, trades and professions. Projects include construction of small domestic building works, residential dwellings, commercial buildings, railways, roads, bridges, tunnels and utility projects; trades include demolition, scaffolding, drilling, plumbing, plastering, joinery, painting, glazing, roofing and construction (Companies House, 2015). To deliver these projects the industry commonly relies on *ad hoc* teams (Maylor, 2005), which brings its own complexities and management challenges, and highlights the need for students to develop professional practice knowledge and skills in order to operate effectively in such an environment. Developing only graduates' academic knowledge limits their opportunity to develop professional effectiveness for employers and industry. Companies vary in size from self-employed tradespeople to a national company with annual turnover in excess of £8 billion (The Construction Index, 2016) and produce bespoke work for both public and private sector clients. It could be considered ironic that an industry which creates considerable wealth and which facilitates the accumulation of capital also experiences a high number of work-related injuries and fatalities among operatives working on-site, the construction industry being one of the UKs most dangerous (Health and Safety Executive, 2017).

Built environment firms also serve other indirect functions, for example helping governments achieve social or political objectives by producing hospitals, educational establishments (Warren, 2000) and affordable housing. This illustrates the unique role the industry plays in the UK. Buildings can create a sense of heritage - of place through character and aesthetic (Worthing and Bond, 2008) - and reinforce social bonds and

boundaries which persist long after the construction phase (Power, 2012). Indeed, that buildings exert influence on human behaviour was a point observed by Winston Churchill in 1943, when arguing that the physical space of the House of Commons shaped the conduct of Parliament (Roth, 1994). The construction industry, therefore, contributes to important yet sometimes complex and subtle dimensions of the UK economic and social landscape.

Built environment professionals include, but are not limited to, architects, construction managers, quantity surveyors, real estate surveyors, building surveyors, civil engineers, structural engineers, project managers and, more obliquely, planners. Industry practitioners are highly qualified and skilled professionals who are responsible for delivering multi-million pound projects on time and within budget (Walker, 2002). Practitioners operate in a complex project-based environment, and this is the environment for which students in the Department are preparing.

1.3 Rationale for this research

The rationale for this research originated from students dissatisfaction with feedback as evaluated in both the NSS and the ARU Module Evaluation Survey (MES). The MES is a questionnaire which seeks to find out students perception of each module they study. Initially, it was intended the thesis would examine only the feedback part of the learning experience. Analysis of assessment feedback gathered in Stage One of this DProf revealed that there was no explicit reference to professional practice. The courses under study seek to prepare students as industry practitioners and so it could have been assumed that there may be reference to practice-based activities in the feedback. It was acknowledged that the sample was small, but nevertheless this was worthy of further investigation.

It was noted that neither the NSS nor the MES asks students to evaluate the extent to which assessment and/or feedback meet their professional development needs in preparation for work as industry practitioners. This highlighted that there was, at best, a dearth of data regarding students' perception of the efficacy of their course in respect of either feedback or assessment in terms of preparing students for employment in industry. This was important because evidence shows that authentic assessment with allied feedback is an effective learning experience on professionally based courses, for example nursing, and helps prepare students as more effective practitioners (Chong, et

al., 2016). Understanding assessment and feedback more clearly from the perspective of built environment students was important in order to be able to understand how to provide an enhanced experience. Further, concern has been expressed surrounding graduates preparedness for industry. The CIOB noted that 34% of construction employers felt graduates had not developed appropriate skills for industry (Rawlins and Marasini, 2011). It is also recognised that built environment graduates often lack practice-based competencies and so present challenges to their employer: they need support to achieve the necessary degree of competence; they are not as efficient as necessary in respect of their earning capacity; and, they may be at increased risk of professional error (Quarterman, 2017).

In light of the foregoing, this research is seeking to understand how assessment can be made more authentic to professional practice and, allied with assessment feedback, enhance built environment undergraduates' learning experience. This research would most profitably be conducted on two fronts. Use of comparative case studies would help to generate ideas for the modifications to practice for action research. This action research would seek to modify assessment, and allied with assessment feedback, having the goal of providing an enhanced experience for built environment students.

1.4 Development of the central research question and sub-questions

The significance of this research lies in its contribution to solving the on-going problem of built environment students' evaluation of assessment feedback as the weakest aspect of their formal learning experience. This research also contributes to theory concerning authentic assessment for built environment undergraduates and provides a definition of what authentic assessment on built environment courses may encompass. Resolving this problem should also help to address employers' concerns regarding graduates lack of preparedness for employment as industry practitioners. To address this problem and also address the gap in knowledge, research questions were formulated to provide a focus for the study. There is a central research question which provides a clear focus and goal for this thesis. This is underpinned by four sub-questions, which provide direction for the research (Cohen, Manion and Morrison, 2018). The central research question and sub-questions are as follows.

Central research question

How can assessment be made more authentic to professional practice and, allied with assessment feedback, enhance built environment undergraduates' learning experience?

Research sub-questions with a rationale for each

1. How is professional practice included in courses?

The first sub-question allowed the researcher to examine the current situation at the start of this research in respect of how professional practice was included in courses.

2. How can professional practice be made explicit in assessment?

The second sub-question allowed the researcher to evaluate how professional practice can be made explicit in assessment. As assessment is the focus of students learning activities (Brown, Bull and Pendlebury, 1997), its design is crucial for students' development as effective practitioners. If assessment does not help students to develop appropriate knowledge and skills, then its value on accredited courses is significantly diminished.

3. How can feedback on assessment be designed and used to reinforce learning in the context of professional practice?

The third sub-question seeks to understand how feedback, which is integral to effective learning, can be designed and used to support development of students' professional practice knowledge and skills as well as their academic learning. This would help students realise the value of feedback and support further development of their knowledge and skills.

4. How can students gain the most value from feedback on assessment in relation to their personal professional practice?

The fourth sub-question was concerned to understand how students can be supported or guided to make most effective use of their feedback in relation to their personal professional practice. Helping students to gain most value from feedback offers opportunity to develop their preparedness for industry as well as their academic learning.

1.5 Methodology

As applied research, this work has a practical goal (Gray, 2014) and for this reason focuses on a particular problem in one setting. This work is concerned with investigation of a particular issue and undertaking methodical inquiry process to add to knowledge or solve problems (Bell, 2010). It is anticipated that this research will suggest beneficial revisions to practice that will also prove helpful to tutors on similar courses. The methodology is that of comparative case studies to generate ideas for action research. It must be noted that all changes made during this action research were seeking to enhance the student experience, recognised through NSS and the ARU MES as having room for improvement in respect of assessment feedback (Chapter 1, Section 1.1.3). It is expected that, on the issue of generalization or transferability, findings should be of interest to those in similar built environment higher education settings.

1.6 Expected contribution to knowledge and impact

1.6.1 Expected contribution to knowledge

Findings of this research are designed to make an original contribution to knowledge in this area and to have practical application for built environment courses in the institution under study. This should have value for built environment undergraduates and tutors. In addition, these findings should be of interest to those responsible for similar courses at other HEIs.

First, this work supports pedagogic practice through contributing to knowledge of means by which authentic assessment and allied assessment feedback may support built environment students learning and development. This offers scope to develop students in preparation for industry and contribute to their preparation to join the relevant professional body. This is encapsulated in an authentic assessment toolkit for built environment tutors.

Second, the scholarly contribution of this research resides in its development of theory, integrating professional practice with assessment and assessment feedback. This work builds on Chong, et al., (2016) which is developed from Bloom's taxonomy of educational objectives (Bloom, 1956) illustrating how these integrate through authentic assessment to develop students' knowledge and skills in each domain. This work

identifies routes to an authentic learning experience for built environment students, helping them to develop employability skills as well as professional practice.

Third, this work adds to the existing body of knowledge surrounding assessment feedback by developing theory for the benefit of built environment students and tutors. The work also recognises the need to develop built environment students assessment literacy and feedback literacy (Chapter 2).

1.6.2 Expected impact of this work

It is anticipated that this work will have an impact in a number of respects. Revised assessment and assessment feedback offer potential to enhance students' academic achievement and also their professional practice knowledge and skill development. Authentic assessment offers students an opportunity to practise and develop their professional practice skills in the safe environment of a higher education setting.

Second, the design of authentic assessment and assessment feedback may help students' to link theory and practice, thereby giving their formal learning more meaning and purpose. As students in the Department find making this connection difficult (Crabtree, 2014) there is scope to enhance this aspect of their learning experience.

Third, authentic assessment helps students take a deep approach to their learning as it pushes them to actively engage with their subject.

Fourth, authentic assessment may add to course appeal and credibility. Employers and prospective students are more likely to appreciate courses offered by the Department if they better develop students as practitioners and are evaluated favourably by students.

An output of this research is a toolkit for built environment tutors in respect of authentic assessment and allied feedback. This will provide suggestions for routes to enhance the authenticity of assessment and assessment feedback to further support students learning through provision of an experience which supports their development for industry as professionals.

1.7 Key terminology

It is appropriate here to define key terms used in this research in order that clarity is established early in the work.

1.7.1 Authentic assessment

Authentic assessment is assessment which replicates or embeds aspects of the real or professional world. In this research it is considered that, by necessity of the multi-disciplinary courses under investigation, it is appropriate to consider assessment as having a continuum of authenticity. This means that authentic assessment may range from simulating activities undertaken by professionals to incorporating some aspect of the real world but which may not replicate practice-based activities. Simulating real world activities would require students to undertake assessment which replicated the work of practitioners. Such authentic assessment activities may have their authenticity diminished through the inclusion of features which suggest the academic reason for undertaking the work. At the other end of the continuum, assessment of theoretically-based subjects may have a degree of authenticity introduced through the inclusion of the real world, for example use of real world resources. This is examined further in Chapter 2, Section 2.3.2 of this thesis.

1.7.2 Assessment feedback

Assessment feedback is any exchange surrounding assessment. In particular, this refers to comments “that lecturers and tutors provide for the written work submitted by undergraduate students” (Li and De Luca, 2014, p.378). This is discussed further in Chapter 2, Section 2.4.

1.7.3 Constructive alignment

Constructive alignment refers to learners making meaning by selecting and constructing their own knowledge through learning and assessment activities they undertake in their formal learning (Biggs, 1996). Learning should be active (Joseph and Juwah, 2011), and this should include assessment activities. In this research, the goal of such alignment would be to enhance students’ learning in readiness for industry through authentic assessment which encourages or requires completion of assessment tasks that press students to engage with the real world rather than solely engaging with theory. In this thesis, there is focus on authentic assessment being more authentic to professional practice and having allied feedback to further support undergraduates

learning experience. The goal of these being to support students learning and development in readiness for industry.

1.7.4 Professional practice

Professional practice refers to the work-based activities undertaken by industry professionals. In this research it is assumed that professionals are highly qualified practitioners, many being members of the relevant PSRB. Professional practice is examined further in Chapter 2, Section 2.5 of this thesis.

1.8 Overview

1.8.1 Overview

The thesis provides theory-based chapters, then data-based chapters which are followed by discussion and finally conclusions. Table 1.1 provides a summary of the chapters of this thesis.

Table 1.1 Summary of this thesis

Chapter	Content
1 Introduction	An overview of the thesis, central issues, the research strategy and the intended contribution to knowledge.
2 Theoretical perspectives	This chapter critically examines central theoretical issues and their relevance to this study.
3 Research design, methodology and methods	The thesis has an anti-positivist approach, gathering qualitative data in order to examine issues involved; methodology is comparative case studies and action research. Methods of gathering data were from documents, focus groups and interviews. Data was analysed using thematic analysis.
4 Action research process	This chapter takes the reader through the action research. It details activities undertaken and explains the researcher's thought processes as they influenced modification to practice.
5 Presentation of findings regarding	This chapter provides analysis of the data, with examples, to illustrate findings regarding how professional practice is included in courses.

research sub-question one	
6 Presentation of findings regarding research sub-question two	This chapter examines how professional practice can be made explicit in assessment and outcomes of changes to assessment practice. It addresses the second sub-question.
7 Presentation of findings regarding research sub-question three	This chapter evaluates feedback on assessment to reinforce learning in the context of professional practice. It addresses the third sub-question.
8 Presentation of findings regarding research sub-question four	This is the last of the data-based chapters, and addresses the fourth sub-question. It is concerned with students gaining most value from their feedback.
9 Discussion	Drawing together and discussing the findings from the four previous chapters, this chapter discusses the findings and implications for practice and theory and provides a tutors' toolkit for assessment and allied feedback.
10 Conclusions, recommendations and reflection	This chapter provides conclusions and recommendations of the thesis. These are followed by a reflective account of the researcher's DProf journey from Stage One through to completion of this thesis.

1.8.2 Publications made as part of this study

Three conference papers, each double-blind peer reviewed by two reviewers, were published during the course of this study, plus one conference presentation and one conference workshop were given (Appendix A). Details of these are below.

Vohmann, B., Crabtree, P., Priddle, J., and Sherratt, F., 2015. Assessment feedback to enhance student development as effective construction industry practitioners. In: ARCOM, *Thirty-first annual conference*. Lincoln, 7 to 9 September 2015. Association of Researchers in Construction Management. [1]

[1] Contribution of the researcher to the production and writing of this paper was 80%.

Vohmann, B. and Frame, I., 2016. Professional practice and construction undergraduates' employability skills. In: ARCOM, *Thirty-second annual conference*. Manchester, 5 to 7 September 2016. Association of Researchers in Construction Management. [2]

Vohmann, B., Crabtree, P., Priddle, J. and Frame, I., 2017. Mode of study influences built environment students' perception of their professional development. In: ARCOM, *Thirty-third annual conference*. Cambridge, 4 to 6 September 2017. Association of Researchers in Construction Management. [3]

One conference workshop was given, as follows:
Frame, I. and Vohmann, B., 2015. Giving and getting more from assessment feedback. In: Anglia Ruskin University, *Annual Anglia Ruskin University FST Learning, Teaching and Assessment Conference.* Cambridge, 30 June 2015. Cambridge: Anglia Ruskin University. [4]

One conference presentation was given, as follows:
Vohmann, B., 2017. Perspectives of assessment: a view from the bridge. In: Anglia Ruskin University, *Annual Anglia Ruskin University FST Learning, Teaching and Assessment Conference.* Cambridge, 12 January 2017. Cambridge: Anglia Ruskin University.

1.9 Summary of this chapter

This chapter has identified the need and rationale for this study. The current situation in HEIs, industry and the UK economy has increased the pressure on HEIs to develop students as effective practitioners. This chapter has identified the context and setting for this research. It has provided the reader with a summary of the research methodology and has delineated the impact and expected contribution to knowledge of this work.

[2] Contribution of the researcher to the production and writing of this paper was 98%, and included thematic analysis of data.
[3] Contribution of the researcher to the production and writing of this paper was 95%.
[4] Contribution of the researcher to the production and writing of this workshop was 75%.

Making assessment more authentic to professional practice and, allied with assessment feedback, enhancing the built environment undergraduate learning experience is the focus of this research. This has practical application for the areas under study and potentially for other similar departments or courses at other HEIs. As a DProf seeking to change practice, practical application is one important goal of this research.

Chapter 2 Theoretical Perspectives

2.1 Introduction to this chapter

Having outlined the problem under investigation and the context in which it sits, this chapter provides the reader with theoretical perspectives pertinent to this doctorate. This chapter feeds into the research design of Chapter 3.

Authentic assessment is of interest in this thesis, having practical application for the area under study and potentially also for other similar courses at other HEIs. The purpose of this DProf is to critically appraise how assessment can be made more authentic to professional practice and, allied with feedback, enhance built environment undergraduates' learning. As may be noted, HEIs do not always meet industry's needs well, in particular in relation to preparing students for employment in industry (Chapter 1, Section 1.1.4). This research examines the role of assessment, as it is known to focus students' learning (Black and William, 1998). This is examined through the lens of authentic assessment with corresponding feedback, which has potential to develop students' academic learning and foster their professional practice knowledge and skill development.

2.2 Knowledge and learning

Having explored the root cause of the problem under investigation and the context in which it sits, this work now provides readers with a critical review of theories of knowledge and learning. It is important to understand the nature of knowledge and learning in order to be able to appreciate issues in higher education when deciding which knowledge is appropriate for inclusion in courses and how it should be delivered.

2.2.1 Knowledge

Knowledge is defined as "1 information and skills acquired through experience or education. ► the sum of what is known. ► Philosophy true, justified belief, as opposed to opinion. 2 awareness or familiarity gained by experience" (Oxford University Press, 2006, p.789). These two definitions correspond to some extent with Mode 1 and Mode 2 knowledge. Mode 1 "traditional knowledge … generated within a disciplinary, primarily cognitive, context" (Gibbons, Limoges and Nowotny, 1994, p.1), is formal, can be recognised through academic qualification and may be considered 'prestige' knowledge. However, Mode 1 knowledge is bounded within the dominant power-based

structures of academia (Nowotny, Scott and Gibbons, 2003). By contrast, Mode 2 knowledge is “created in broader, transdisciplinary social and economic contexts” (Gibbons, Limoges and Nowotny, 1994, p.1) and a greater variety of locations than Mode 1 knowledge (Scott, 1995). Mode 2 knowledge has focus on professional practice and problem solving (Gibbons, Limoges and Nowotny, 1994), suggesting some knowledge may be tacit, context dependent and practical (Gascoigne and Thornton, 2013). Therefore, each of these types of knowledge are important in this research because both are contained in built environment and other professionally recognised undergraduate courses. It is important to note here that this work does not seek to elevate one mode of knowledge - Mode 1 or Mode 2 - above the other. Each mode of knowledge is necessary for undergraduate built environment courses, providing appropriate knowledge and skills for students’ development and preparedness for industry.

Knowledge then may be formal or tacit. More opaque aspects of knowledge include its political dimension (Apple, 2004) and role in a global discourse that positions knowledge as a commodity (Zeleza, 2007) and that supports the ruling class retain their hegemony and economic situation (Wright Mills, 1956; Bernstein, 1977; Willis, 1977; Lefebvre, 1991; Bourdieu, 1996). This has implications for HEIs. As seats of learning and knowledge, it may have been supposed universities have the ability to decide what is considered appropriate knowledge for undergraduate courses and who should study on those courses. However, such decisions are influenced by a disparate range of political and economic forces outside institutional control. Therefore, knowledge considered appropriate for built environment undergraduate courses is the outcome of a range of forces, some of which may be more readily perceived than others.

2.2.2 Learning theories

Learning theories are frameworks to consider ways that individuals learn, that is how they acquire or create their own knowledge. In this section, learning is defined and then learning theories of behaviourism, cognitive theories and constructivism are examined. Each of these theories may be deployed so as to contribute to creating an appropriate learning environment (Ertmer, Newby and Medsker, 2013). This is followed by consideration of Kolb’s learning cycle and learning styles.

Learning is when people can demonstrate something previously they could not do or did not know (Honey and Mumford, 1992). Formal learning often occurs in an educational institution, non-formal in the workplace and informal emerges from day-to-day activities (Rubenson, 2010). Learning may also occur through experience (Kolb, 1984), which has been recognized as valuable to facilitate learning (Dewey, 1966; Honey and Mumford, 1992). Through learning activities, formal or informal, individuals create their own knowledge (Biggs, 2003). However, “students’ understandings often struggle to reach beyond the specific context” (Maton, 2009, p.44). In built environment courses, experience is particularly important to help students develop appreciation of the complex nature of their industry and the demands placed on practitioners. This underscores the important role of tutors; their responsibility to create a suitable learning environment (Race, 2010) that encourages student engagement with learning. The Warnock Report (1978), considering special educational needs, deemed that learning incorporates experience, involves developing understanding and includes preparation for participation in society. The important theme running through these definitions of learning, despite their different perspectives, is change occurring within the learner. The challenge for tutors and HEIs is to decide what change it is appropriate to develop in the learner and how to effectively assess such change.

Built environment undergraduate courses include both formal learning and non-formal learning of professional practice. Yet there is the danger that formal learning in an HEI setting, with focus on Mode 1 knowledge, may potentially marginalise non-formal practice-based learning of Mode 2 knowledge. This raises questions concerning what knowledge and learning are considered appropriate and valuable for undergraduates. Given that Confederation of British Industry (CBI) members have expressed concern regarding graduates preparedness for industry (CBI and Pearson, 2014) and the need for HEIs to equip students for employment (Dearing, 1997), then developing appropriate knowledge and skills in students is important if the Department is to be as effective as possible in delivering courses. This highlights the value of both Mode 1 and Mode 2 knowledge to help students develop as practitioners. This work does not debate the merits or value of different modes of knowledge, it simply acknowledges they exist and recognises their important contribution to the student experience.

2.2.2.1 Learning theories

Learning theories are now examined to provide insight into ways people learn. These are relevant to this research which is concerned, in part, with how people learn and thus how best to support students through their formal learning experience.

The first learning theory considered here is behaviourism, which is concerned with an individual's reaction to stimulus (Cotton, 1995). The environment, over which tutors have considerable influence, is of great importance for learning. Whereas the student has responsibility for their learning, the tutor's role is to provide stimulus to provoke response, or learning. In HE, a key stimulus to provoke learning is assessment (Race, Brown and Smith, 2005). Behaviourism suggests tutors can modify students' behaviour, their reaction to stimulus, by the environment they provide (Skinner, 1974), including assessment. In a behaviourist model then, much depends on the tutor and the environment they create, wittingly or not. Judiciously designed assessment is particularly important as it is a key part of the learning environment, and "students' perceptions about assessment and their approaches to learning are strongly related" (Struyven, Dochy and Janssens, 2005, p.336).

In contrast with behavioural theories of learning which link responses to stimuli, cognitive theories emphasise learning as data processing by the mind and the individual's preferred way to process knowledge (Evans, Cools and Charlesworth, 2010). Formal learning occurs in response to situations created by the tutor (Piaget, 1964). Piaget has been a highly influential cognitive theorist, particular for primary school educators, and much formal primary school education has taken Piaget's methods to heart with a child-centred approach to learning becoming widely used in the 1950s and 1960s (Cunningham, 2006). Yet cognitive theories tend to have a rather narrow focus for learning, emphasizing stages of development and the individuals processing of information. In a cognitive paradigm, skills and aptitudes tend to be somewhat marginalised as the focus is on mental processes. This, therefore, suggests tutors have opportunity to consider how they communicate their subject and help students undertake learning that has application beyond the classroom, including to professional practice.

Constructivists view learning as a mental construction, an active process (Darby, 2003) requiring learner application. New learning takes place when the learner adds to their current understanding (Keogh and Naylor, 1996) and constructs their own meanings (Pritchard, 2009). In some respects constructivism can be seen as a development of

cognitivism. Learners are seen as constructing their own learning with support from tutors to help their journey of discovery. Experience is integral to this construct (Kurt, 2011) and focus is on the learner (Sun and Williams, 2004). However, constructivism requires sensitivity from tutors providing careful guidance to help students learn (Taber, 2011). This suggests effective student learning activities are contingent to some extent on tutors support and guidance. Wherever the learning occurs and whatever its type, formal or informal, the learner remains central but the tutor plays a valuable role. This role, therefore, should involve dialogue or communication in some form, which has complex dimensions (Rees and Porter, 2015) and consequences for students' learning.

A problem-based constructivist pedagogy requires tutors to design assessment that provides a relevant learning experience. A problem-based teaching approach is regarded as having a less effective impact on student learning (Kirschner, Sweller and Clark, 2006). This distinction between teaching and learning is important; the goal is to enhance student understanding. It is possible that not all tutors have experience of professional practice in the built environment, meaning that they have no such experience from which to draw in their design of assessment or feedback. Importantly, this suggests that courses benefit from having some tutors with practice-based experience from which they can create valuable learning opportunities and assessment, thereby providing students with insight to professional practice.

A common theme running through these theories is the relationship between the student, the subject and the role of the tutor. However, built environment students practice-based knowledge is dependent largely on the extent of their professional practice experience. Even between part-time students working in practice there is considerable diversity of professional practice experience and knowledge. Therefore, assessment design needs careful consideration to be an effective learning experience for all students, supporting development of their professional practice knowledge and skills as well as Mode 1 theoretical knowledge. This will be explored in Chapter 6 of this thesis.

The expansion of HE (Chapter 1) has been accompanied by a pedagogic paradigm shift from a didactic, tutor driven, behaviourist approach to a constructivist student centred approach (Szili and Sobels, 2011) with tutors as facilitators. However, this shift carries implications for teaching, learning and assessment. In the current increasingly competitive higher education environment (Department for Business, Innovation and Skills, 2016) pressure to be, or be seen as, a successful institution is likely to intensify,

in whatever way such success is defined. This may become an even more pressing issue in the current uncertain political landscape, as much remains uncertain in what potentially may become a rapidly changing economic environment with consequences that this may bring for industry and HE. Tutors expertise at supporting development of students' academic knowledge and professional practice skills is more important than ever.

Reflection on performance is a valuable skill of effective practitioners, along with the ability to subsequently modify and improve their own professional practice. This chapter now examines Kolb's learning cycle, which is concerned with stages considered necessary for effective learning. Kolb identifies four integrated phases of learning within which reflection is included (Figure 2.1). The learner, Kolb argues, joins the cycle at any of the four points and progresses around the cycle. Once complete, the learner repeats the cycle, and so on. If the learner progresses through the cycle revising their behaviour having learned from experience, then an improved experience could reasonably be expected to follow.

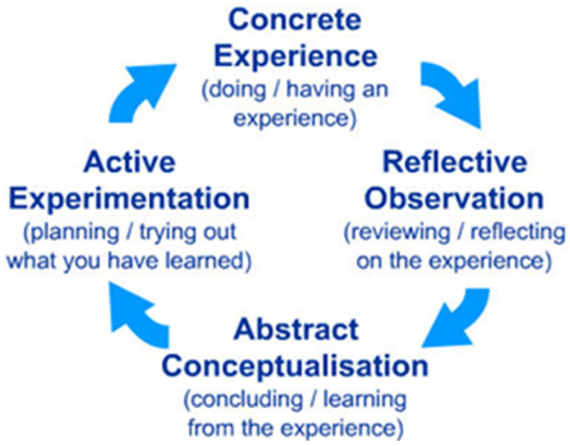

Figure 2.1 Kolb's learning cycle (Davies, 2013)

For Kolb, learners each have their own preferred way of learning and importantly, as the student passes through the stages of learning, so they create for themselves different forms of knowledge. Kolb refers to these as "elementary forms of knowledge … [that] become the building blocks" for higher levels of knowledge (Kolb, 1984, p.42). It is interesting that Kolb includes reflection in this cycle, as reflective practice is identified as a quality of effective practitioners (Thompson and Thompson, 2008). However, in contrast with Kolb, Schön (1983) takes a more finely nuanced approach to reflection. He recognised the value for professional practitioners of reflection to help

them become more effective and also to develop. Schön focuses on reflection as necessary for development of an effective professional, with reflection on activities and how revised behaviour could lead to an improved outcome. This, therefore, suggests the importance of considering carefully what behaviour, including reflection, is encouraged within the formal learning process.

There are criticisms of Kolb on grounds of theoretical weakness (DeCoux, 1990; Garner, 2000), nevertheless, Kolb does provide a very useful framework, which highlights something of the practical yet complex nature of learning and which hints at the challenge facing tutors. Interestingly, Kolb suggests that the role of the tutor is to encourage and facilitate student progress between phases of the cycle (Cowan, 2006), a student-centred constructivist approach. This has implications for this work, and suggests that one role of the tutor is to support students as they progress through the learning cycle, their learning being stimulated at least in part by assessment and assessment feedback. This, therefore, highlights the significance for student learning of assessment design and the value of tutors' contribution to promote student reflection and conceptualisation as each student progresses through the learning cycle.

Eastcott and Farmer (1995) develop Kolb's cycle as a spiral to illustrate the learner progressing to new cycles as their learning develops (Figure 2.2). Visually this is helpful as it illustrates the learner progressing to new cycles of learning. However, it does not change Kolb's fundamental concept of experience, reflection, conceptualisation and active experimentation. For built environment undergraduates this developmental spiral should be designed to include development of their professional practice knowledge and skills in order to contribute to their development as effective practitioners. This is particularly useful for part-time students as it has immediacy of application in the workplace.

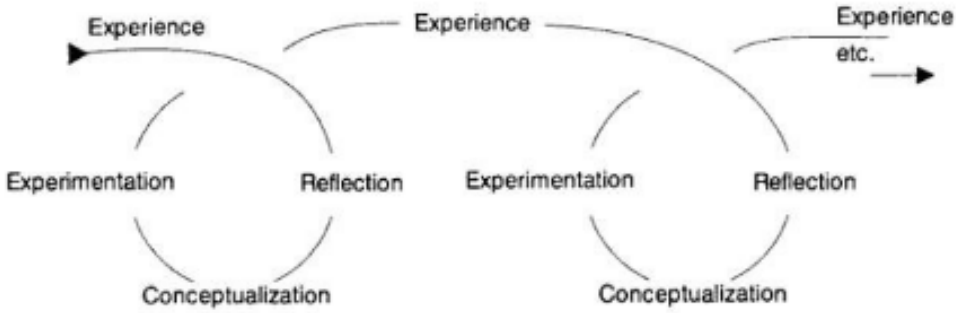

Figure 2.2 Kolb's learning cycle as a developmental spiral (Eastcott and Farmer, 1995, p.16)

Honey and Mumford (1992) build on Kolb's work. They argue that most people develop a preference for a particular learning style, their preferred "means of acquiring knowledge and skills" (Pritchard, 2009, p.41). The learner styles that Honey and Mumford identify are activists, reflectors, theorists, and pragmatists (Honey and Mumford, 1992). Formal learning, it is argued, will be more successful if the learner utilizes their preferred style, as this contributes to academic achievement (Komarraju, et al., 2011). This, therefore, suggests the most fruitful strategy for tutors is to deploy a diversity of pedagogic devices so that each student may find an effective route for their own learning - the push and pull of motivating students (Munro and Cook, 2008). Further, the learner can change their preferred style of learning if they so choose or circumstances provoke it (Honey and Mumford, 1992). This infers that there are opportunities for tutors to create challenging assessments for students that, combined with effective pedagogic practice, may help students develop a range of learning styles, a valuable skill for practitioners.

These learning theories are valuable as they provide insight to how students learn and challenges facing tutors. The activities undertaken by students and tutors shape the student learning experience. The outcome is what students learn and skills they develop, not what was taught. This highlights the importance of assessment and feedback as these are central to students' learning activities. This also suggests that it is vitally important that what is assessed aligns with knowledge and skills it is intended students develop.

2.2.2.2 Quality of learning

Having discussed learning theories, it is appropriate to consider the quality of learning, sometimes known as a deep approach to learning (Eastcott and Farmer, 1995). This is concerned with learners' comprehension of a subject rather than simply reproducing it (Higher Education Academy, 2004; Baek and Lee, 2012) or merely memorizing. Approaches to deep learning emphasize interaction with the subject (Cotton, 1995) and the learner researching for themselves (Biggs and Telfer, 1987). This is important because it highlights that the learner has responsibility for their own learning and that it is important they engage with it as fully as possible. Students need to know how to learn, those strategies they can deploy in order to realise their learning potential.

The opposite of deep learning, shallow learning, can secure good grades (Race, 2010) and may lead tutors to believe, erroneously, that deep learning has taken place. This highlights the importance of creating suitable assessment to encourage students' learning (Smith and Colby, 2007) and to facilitate deep learning (Boyle and Ravenscroft, 2012). Therefore, assessment design, which is the tutors' starting point, requires careful consideration of what it is intended that students learn, although assessment often for students is an end point and the attention of their learning activities.

Assessment design is influenced by the assumptions and knowledge held by tutors (McNeill, Gosper and Xu, 2012). Those tutors who regard learning as acquisition of knowledge tend to see assessment as a gauge of whether students can reproduce information (Maclellan, 2005), a shallow approach to learning. In contrast, tutors who regard learning as development of critical thinking skills tend to view assessment as an integral part of the learning process and value students ability to respond to new problems (Samuelowicz and Bain, 2002). The challenge for tutors is to consider what skills and knowledge they intend students to develop; then to design assessment which encourages students to undertake deep learning (Hakkarainen, et al., 2004) to achieve these assessment goals.

To encourage deep learning, learning goals of acquiring knowledge or skills are important (Grant and Dweck, 2003). However, higher education structures and systems tend to focus on measurable results rather than deep learning. This work is concerned with "meaningful" (Entwistle, 2009, p.16) deep learning. As part of that, assessment should be used "as a powerful tool for promoting deep learning activities" (Hassanpour, et al., 2011, p.3591).

This thesis now turns to the subject of learning objectives in relation to deep learning. Bloom's taxonomy is composed of behaviours in "three domains – the cognitive, the psychomotor, and the affective" (Bloom, 1956, p.19). At the top of the cognitive domain are higher order skills requiring the student to synthesize and evaluate (Krathwohl, Bloom and Masia, 1964). The cognitive domain and higher order skills tends to attract most attention, particularly in academia (Price, et al., 2012). Well-designed built environment assessment should encourage engagement and a deep approach to learning (Biggs, 2004 cited in Healey and Roberts, 2004) to help students develop appropriate knowledge and skills. This should include development of their cognitive, affective and psychomotor skills. These skills are each necessary in the workplace, for which students in the Department are being prepared. Therefore, developing appropriate knowledge and skills is necessary for students, industry and the economy, and should develop students' proficiency in each of Bloom's domains.

Vygotsky's zone of proximal development can be defined as a gap between what a student can achieve independently in comparison with what they can do with tutors support (Murphy, Scantlebury, and Milne, 2015). Vygotsky argues that, with tutors' support, students can gradually improve their learning to achieve those things which they could not previously do (Figure 2.3). Context is also a contributor, both social and cultural (Hedegaard, 2005), and arguably for built environment students professional context is limited in the artificial setting of the classroom. The challenge for tutors is being able to help students' link formal learning with professional practice and thereby promote effective learning; authentic assessment offers one route to achieve this goal. This is an important point which will be explored in Chapter 6.

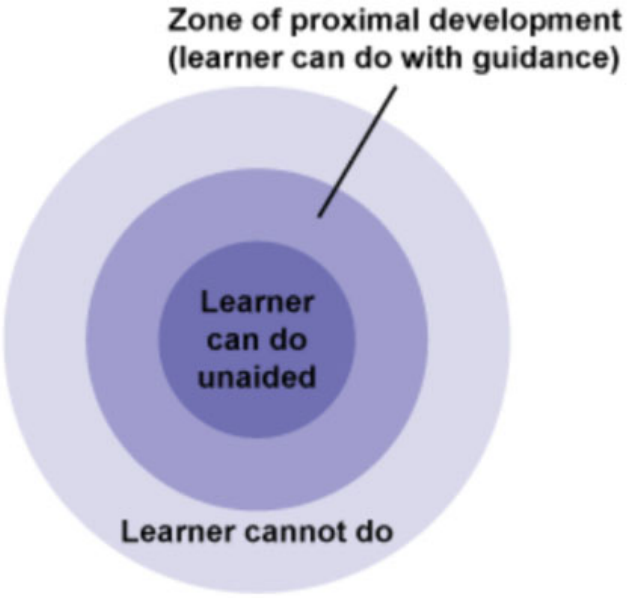

Figure 2.3 Vygotsky's zone of proximal development (Open University, 2018)

2.2.2.3 Intended Learning Outcomes

Intended Learning Outcomes (ILOs) are designed to provide a clear and widely available description of what it is intended students are to learn, and may be informed by the relevant Subject Benchmark Statement (QAA, 2016). This may include learning of a capability or role (Gosling and Moon, 2002). Constructive alignment refers to the alignment of teaching activities, intended learning outcomes and assessment tasks (Biggs, 1996; Biggs and Tang, 2011) and offers improved outcomes for students (Larkin and Richardson, 2013). The object of constructive alignment is to encourage deep learning and enhance the student learning experience. Constructivism (Kirschner, Sweller and Clark, 2006) suggests how tutors might help their tutees learn, although the quality of tutors' pedagogic approach influences whether students' take a deep or shallow approach to learning (Trigwell, Prosser and Waterhouse, 1999). Further, pedagogy and authentic assessment should also align with assessment feedback, which has been recognised as vital for effective learning (Eraut, 2004).

Biggs work on constructive alignment has been widely accepted as providing a useful model to underpin effective teaching and learning strategies (Wang, et al., 2013). This thesis contends that, in addition to Biggs constructive alignment, assessment and assessment feedback should be constructively aligned with professional practice to help students develop as effective built environment practitioners. This alignment is important to provide a focus for learning activities, to integrate Mode 1 and Mode 2

knowledge, and to develop students' academic and professional practice and employability knowledge and skills. In short, authentic assessment to link assessment activities with professional practice, and allied with feedback, to support students' development as effective built environment practitioners.

It follows that aligning professional practice with teaching, learning, assessment and assessment feedback could then be part of an integrated pedagogic strategy. Assessment could authentically reflect professional practice and contribute to students' development as effective practitioners as well as develop their Mode 1 knowledge. It could be argued that professional practice, Mode 2 knowledge, while important in built environment courses, potentially may sometimes be marginalised while prestige knowledge remains highly valued. Drawing these threads together, tutors play a central role in creating a supportive assessment environment designed to focus to students' efforts on appropriate academic learning (Biggs, 2003) that additionally should develop students' professional practice and employability skills.

In built environment courses, there are particular problems in respect of designing assessment which replicates industry. Potentially this may be a cause for concern as, unlike for example optometry, which is used as a comparison case course study in this work (Chapter 3), where an entire eye examination may be completed in twenty minutes, in the built environment projects take much longer than this. For example, projects can take several months or years to complete and some activities cannot easily be replicated in the artificial setting of the classroom. It may be that in some instances the most practical route is through use of computer simulation although potentially this might not always be an effective simulation of the real world. Consequently, in designing authentic assessment, built environment tutors sometimes have to make a choice. They could base authentic assessment on one facet of a project or design assessment which is more a description of practice-based activities rather than something that is authentic to practice or incorporate authentic resources. None of these may be an ideal solution, and, therefore, tutors may have to consider routes to diminish the impact of this problem for students' learning.

This section of the work has discussed learning theories and issues around the quality of learning. These should be considered in light of assessment as this is one contributor to students' learning activities and will now be explored in the following section.

2.3 Assessment

2.3.1 The role of assessment

This work now turns to assessment, as this is the focal point of undergraduates learning activities and is important in this thesis. The Quality Assurance Agency for Higher Education (QAA) define assessment as a process to appraise students "knowledge, understanding, abilities or skills" (QAA, 2012, p.4). Assessment focuses students' attention and shapes student learning (Carless, 2007); it is often considered a device to test that students are able to complete assessment tasks well rather than, more valuably, provide opportunity for students to "develop broader knowledge and skills in the subject" (Sambell, McDowell and Montgomery, 2013, p.34). For government, concerned to increase the UK international competitiveness through investment in human capital (Leitch, 2006), assessment leading to formal qualifications may function as one measure of return on this investment. But whether this alone is a sufficient or appropriate measure is debatable. As one goal of higher education is a contribution to the UK economic growth, development of undergraduates as effective practitioners is important yet apparently insufficiently scrutinised. For built environment courses it appears at least in some areas there is room for improvement in the development of undergraduates' competencies and effectiveness (Hoxley, Poon and Fuchs, 2011; Quarterman, 2017), as often built environment graduate competencies do not meet employers expectations (Witt, et al., 2013).

In this thesis, the term 'formative assessment' refers to assessment which intends to help students learn by providing information regarding their performance (Yorke, 2003) following provision of feedback from the tutor and/or reflection by the student (QAA, 2012). Formative assessment is intended to be integral to learning, and offers students opportunity to improve assessment grades (Jonsson, 2013) in preparation for their summative assessment. Summative assessment occurs at the end of a learning cycle and marks which contribute to achievement of the degree are awarded on summative assessment.

For students, assessment is the focus of their learning activities from the start of the learning cycle, whereas for tutors summative assessment is at the end of the learning cycle (Figure 2.4). Intended learning outcomes form the core of what is to be learned, and if outcomes align with assessment goals then these two align at the start of the learning cycle (Biggs, 2011). The rationale for this alignment is to enhance the learning experience.

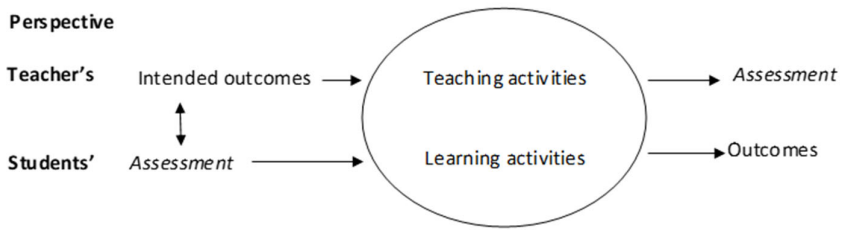

Figure 2.4 Teacher's and student's perspectives on assessment (Biggs and Tang, 2011, p.198)

A difficulty is that often students do not fully appreciate the value of engaging in dialogue around feedback on assessment to enhance their learning (JISC, 2015) despite its potential to enhance their grades or marks. This represents a missed opportunity to enhance students' learning and development. ARU, in common with many HEIs, has only a limited strategy to deal with this gap in practice, itself a missed opportunity; the institutional focus is on providing written summative assessment feedback within a specified timeframe but contains no reference to dialogue. Yet dialogue is an especially important component of effective feedback. It may be verbal or a form of written communication, but its value lies in helping to clarify meaning (Sellbjer, 2015). Implications of this are that it may be beneficial to have a shift in institutional policy to one that provides a framework supporting academics to aid students learning (Scott and Fortune, 2011) through enhancing the dialogue dimension of feedback, and this might include the personal tutor system.

2.3.2 Authentic assessment

Unfortunately, the term 'authentic assessment' does not have any commonly agreed definition (Whitelock and Cross, 2011). Mueller (2014) encapsulates differences between traditional and authentic assessment (Figure 2.5). A key difference between traditional and authentic assessment is the focus on student engagement with real-world problems and tasks, requiring the development of skills in order to apply knowledge and solve a problem, reflecting the difference between Mode 1 and Mode 2 knowledge. This carries implications in built environment courses for the nature of assessment design.

Traditional----------Authentic
Selecting a response----------Performing a task
Contrived----------Real-life
Recall/Recognition----------Construction/Application
Teacher-structured----------Student-structured
Indirect Evidence ----------Direct Evidence

Figure 2.5 Traditional versus authentic assessment (Mueller, 2014)

Authenticity can be regarded as being on a continuum which may range from work-based to classroom activities (Davison, 2011). Importantly, authentic assessment tasks are considered meaningful by students (Whitelock and Cross, 2011). Authentic assessment offers potential to improve students' confidence, knowledge and skills, stimulate deeper learning and can motivate students (Raymond, et al., 2013). It may include use of authentic resources, and this may be particularly important in more theoretically-based subjects in which practitioners would not undertake such an activity yet may engage with such subject matter as appropriate for their own professional practice. Authentic assessment offers scope to develop students' professional practice knowledge and skills as well as develop their formal Mode 1 knowledge. Assessment that is inauthentic may, for example, not require students to undertake a real world activity when such an activity is possible or inauthentic assessment may ask students to describe professional practice activities rather than undertake such activity. This suggests that there may be degrees of authenticity in assessment.

Authentic assessment suggests that at least some Mode 2 knowledge of practical application should be required in order to effectively complete an assessment task. To effectively support students to undertake such assessment suggests a pedagogic approach that is student-centred and facilitative, a more constructivist approach, rather than a didactic tutor-led approach. This, therefore, implies authentic assessment is a valuable complement to traditional assessment. The challenge is to have a balance of assessment, the totality of which meets needs of students' and of employers'.

Authentic assessment refers to assessment that is relevant to the real world (Bosco and Ferns, 2014), replicates real-world challenges and anticipates that the learner will develop skills, knowledge and attitudes required in the workplace (Carter, et al., 2015). Authentic assessment may be considered as assessment that allows students to

demonstrate their knowledge through real-world tasks and intends to help their development as effective practitioners (Maxwell, 2012; Wu, Heng and Wang, 2015).

To design authentic assessment requires assessment literacy of tutors, which is of great importance (Ball, et al., 2012), as is the assessment literacy of students. Tutors who are assessment literate “have a basic understanding of the meaning of high and low quality assessment and are able to apply that knowledge to various measures of student achievement” (Stiggins, 1991, p.535). An effective assessment target would be an assessment which develops students’ ability to solve real world problems that stretch beyond description and theory (Abrams and Gerber, 2013). It is reasonable to assume that assessment literate tutors in professional disciplines would understand the importance of developing students’ professional practice and employability skills in addition to their academic knowledge and problem solving abilities. Yet this requires that as well as being assessment literate, tutors have experience and current knowledge of professional practice. In HE built environment settings this potentially presents a degree of difficulty, as not all tutors may have experience of current industry practice by necessity of their employment in HE. This is perhaps one reason why HEIs are not always as effective as might be wished at meeting the changing needs of industry (Keraminiyage and Lill, 2013). Combined with the problems of assessment literacy then it is clear there is a considerable problem. This has human resource implications for institutions.

There is also the problem that academics professional practice is different from that of built environment practitioners. There is a gap between the two in terms of knowledge required for each and their different activities. For example, tutors are concerned with teaching and research whereas industry practitioners have to deal with day-to-day activities such as ensuring projects are delivered on time and that they meet the client’s requirements. Employers’ concerns regarding students’ employability skill development and the need for HEIs to enhance these in the curriculum has been recognised (Poon, 2012). Curriculum is arguably a series of linked syllabuses enhanced by skills and competencies development within modules (Mälkki and Paatero, 2015). It is possible that skills and competencies become marginalised in assessment if there is focus on students’ acquisition of Mode 1 theoretical knowledge.

The built environment embraces a diversity of professional practice activities and of employers. Authenticity and authentic environments are important in effective development of students’ practitioner skills (Weeks, et al., 2013). The difficulty of

creating assessment to develop students' skills to meet the demands of this complex industry has been recognised in this chapter. Although for built environment disciplines authentic assessment may present particular challenges, nevertheless use of authentic assessment has such important consequences that every effort should be made to provide this in order to support development of students' professional practice knowledge and skills.

The need for authentic assessment is clear. Authentic assessment and assessing students in problem-solving contextualized situations (Biggs, 2003) is vitally important in professionally recognised courses. Assessment is the means by which HEIs develop students' employability skills and prepare them for industry as professionals in addition to supporting their academic learning. Providing this would potentially make learning more relevant for students and serve industry better, thus contributing to the UK international competitiveness (Dearing, 1997). It is reasonable to assume that this would meet students' and employers' needs and expectations more effectively than at present and may also impinge on student satisfaction. The use of authentic assessment which incorporates professional practice will be explored in Chapter 6 of this thesis.

Authentic assessment in this thesis excludes formal written examinations. Such examinations, although an inauthentic or traditional type of assessment, are a component of built environment courses and act to complement other forms of assessment.

2.4 Feedback

2.4.1 The value and types of feedback

Having examined the importance of authentic assessment, this chapter now turns to the issue of assessment feedback because this is integral to effectiveness of assessment as a learning device. Assessment feedback is "appropriate and timely feedback to students on assessed work in a way that promotes learning and facilitates improvement" (QAA, 2012, p.13). Clear informative feedback, used effectively by learners, is an important part of the learning experience (HEA, 2012), and feedback in the context of professional practice activities can help students' preparation for industry (Duijn, et al., 2017). Feedback may take many forms, including written or verbal, and may be personalised or generic for a group of students. Assessment feedback

"includes all *feedback exchanges* generated within assessment design, occurring within and beyond the immediate learning context, being overt or covert (actively and/or passively sought and/or received), and, importantly, drawing from a range of sources" (Evans, 2013, p.71) [italics in original]. It is interesting to note the use of exchange: institutional feedback policies at some HEIs, including ARU, are to provide written feedback, which unfortunately can militate against such exchange or dialogue. However, tutors have at their disposal a range of ways to provide feedback. Therefore, as this section shows, integrating feedback dialogue as part of pedagogic practice offers potential benefits for students' learning, which is the object of feedback.

Feedback on assessment should encourage learning (Hernández, 2012) which in HE contains a predictable curriculum with clear descriptors (Murray, 2008). Effective feedback is "perceived as relevant, meaningful, and encouraging, and also offers suggestions for improvement that are within a student's grasp" (Brown, 1997 cited in Entwistle, 2009, p.155). Thus, it may be seen that effective feedback is valuable for student learning. Indeed, effective feedback can provide a Vygotskyan approach, "scaffolding" students' learning (Sanders and Welk, 2005, p.203). Yet providing such feedback requires thought regarding a range of issues. This has implications for tutors, who need to provide feedback not simply as technical information, although this may be necessary, but being mindful of nuances within their feedback that shape the efficacy of feedback that help effectively develop student learning. Feedback on assessment to reinforce learning in the context of professional practice will be explored in Chapter 7 of this thesis.

The value of feedback is its contribution to student learning and improvement (Sambell, McDowell and Montgomery, 2013; Giles, Gilbert and McNeill, 2014). Effective bespoke feedback should help students to achieve specific goals and to help students develop effective strategies for learning (Gikandi, Morrow and Davis, 2011). As such, feedback should be acted upon by students' (Shute, 2008; Higher Education Academy, 2013) and must be high quality (Sadler, 1998). Given the value of deep learning, and as feedback on performance is usually "the most important factor in learning" (Eraut, 2004, p.803), feedback has an especially important pedagogic role to play. This has implications for HEI assessment feedback policies, which in some cases could benefit from increased emphasis on the learning dimension of feedback rather than focus on the production of written summative feedback. There is a role for tutors in the Kolb cycle of learning. Students need feedback as part of this learning cycle, otherwise it is,

at best, difficult for them to know whether they are achieving appropriate goals and improving.

The starting point for feedback is assessment design. Stiggins (1991) contends that an assessment literate tutor is able to describe achievement goals in terms of subject knowledge, demonstration of thinking skills, desired behaviour and products to be created. Stiggins (2014) subsequently develops this, noting that the tutor would develop suitable assessment to secure evidence of student achievement. This underscores the significance of assessment to shape what students learn or at least what they focus on and also hints at the potential through authentic assessment to develop students as effective practitioners. Prudent design of authentic assessment, therefore, is important for student learning.

Feedback often is provided by tutors, however, there is potential to use, for example, peer feedback as an effective device to help learning, although the value of this remains contested (Walker, 2015; Xianwei, Samuel and Asmawi, 2016). This has the potential to help students learn by receiving feedback, but more importantly having to critique and produce feedback for others can be a challenging and valuable learning experience in its own right. Therefore, embedding such feedback practice within pedagogic practice offers another route to scaffold student learning, a Vygotsky approach to supporting students' development.

Assessment tasks can provide opportunity for formative and summative feedback. Formative feedback concerns improving learning (Li and De Luca, 2014). Students may interpret this as a means to improve their work in order to secure a higher mark, rather than perceiving it as a support for learning. Summative feedback critiques what the student has achieved (Crooks, 2001; Kelly, 2009) following final formal submission of work. However, students may consider summative feedback as justification of their mark and overlook the opportunity to use summative feedback formatively in subsequent learning (Irons, 2008; Price, et al., 2010). Thus, an opportunity to enhance learning is lost, suggesting that students may use formative feedback more than they use summative feedback. Therefore, using formative feedback as a pedagogic device may be valuable for learning and an effective use of tutors' time. This has implications for institutional feedback policies and practice, which tend to focus on summative feedback and also raises important issues regarding the duality of formative and summative feedback, and the use students make of each of these.

Assessment design shapes student learning (Black and William, 1998; Carless, 2007) and is thus the starting point for student learning activities (Biggs, 2003). It is worth noting that assessment criteria may also play a role in students focus on assessment goals. The inter-related nature of assessment and feedback are not always apparent, yet providing effective assessment is the foundation for learning and on which effective feedback should be based. Feedback is pedagogically important and offers scope to enhance student performance (Hattie and Timperley, 2007). The influence of assessment criteria on tutors' construct of feedback is not sufficiently well recognised, yet if students are concerned to achieve high marks then assessment criteria have some role to play in focusing students' learning activities.

It is worth noting that there are differences between students' and tutors' perceptions of feedback. Students' perceptions are linked with the individual tutor (Long, 2013), whereas tutors consider student engagement with feedback as central (Havnes, et al., 2012). Further, it seems that students need information so they may appreciate the purpose and importance of feedback, and understand how to use it (Entwistle, 2009). Therefore, helping students understand the learning and developmental aspect of feedback is an important yet perhaps neglected aspect of the student experience (Orsmond and Merry, 2011), but should be integrated within the learning experience. This is particularly important as not all students are able to use feedback effectively (Gibbs, 2014).

The nature of feedback students receive influences its effectiveness (Hattie and Timperley, 2007). High quality feedback should encourage learners to take a high quality approach to their learning, which is fostered by a "student-focused approach to teaching" (Prosser and Trigwell, 1999, p.68). However, this is not to imply that feedback should always be positive but rather that it should be constructive and critical. What remains important is how the tutor delivers such critically constructive feedback – or for that matter, positive feedback. This has implications for students and how they perceive feedback, which in turn may shape their engagement with learning. It is important that students are 'feedback literate', that they are able to understand and use feedback as part of their learning strategy (Carless and Boud, 2018). There is a danger of feedback being too negative and consequently demotivating students. These issues are relevant, although not the main focus of this work. One concern which will be explored in Chapter 8 of this thesis is to identify how students can gain most value from feedback in relation to their professional practice.

Feedback does not automatically enhance learning or performance. It is important to note that feedback suggesting good performance can lead to a reduction in performance (Kluger and DeNisi, 1998) if the learner becomes complacent following praise. Additionally, many students do not use their feedback, some may lack knowledge of how to use feedback and others may lack motivation. However, it is possible that another problem is student erroneous interpretations of tutors' meanings (Weaver, 2006). Therefore, it is important for tutors to consider how their feedback is likely to be interpreted or perceived, and this reinforces the significance of dialogue in feedback. Implications of this are the need for tutors to have awareness of, and if necessary develop, their communication skills.

2.4.2 Dialogue and construction of learning through feedback

The dictionary definition of dialogue is "discussion directed towards exploration of a subject or resolution of a problem" (Oxford University Press, 2006, p.395). A related, yet different, concept is communication, which is concerned with sharing information (Oxford University Press, 2006) and common understanding (Rayudu, 2010) or perception (Drucker, 1974). Feedback dialogue is a valuable pedagogic instrument (Hyatt, 2005; Hattie and Timperley, 2007) but to be effective there are some key ingredients in addition to academic content. As learning is enhanced by feedback dialogue (Ball, et al., 2012), so such dialogue should be embedded within the learning experience and cycle. This would help the learner recognise what they do well and how they might improve. This is a key role for tutors in Kolb's learning cycle.

Positive attitude and sensitivity – particularly valued by students in the feedback process (Lilly, Richter and Rivera-Macias, 2010) – are essential (Fryer, 2004). Students also value having tutors who engage with them, as being approachable, understanding, have clarity (Madriaga, 2012) and relate feedback to the task rather than to the student (Jonsson, 2013). This is interesting, as anecdotal evidence from within the Department suggests tutors hold a perception that students are interested mainly in their marks and grades rather than feedback. If so, this represents an unfortunate gap between protagonists in respect of an important part of the learning dialogue in constructing the student learning experience. It also illustrates that the human aspect of dialogue can have important consequences which, perhaps, are seldom considered by those involved. This point is further examined in Chapter 8.

The feedback dialogue then is composed of a complex amalgam of factors, the outcome of which has consequences for students' learning. It is possible that students, and indeed tutors, sometimes neglect a two-way feedback dialogue and instead have a one-way flow of information. This implies that if either party understands feedback as one-way communiqué and not dialogue, then their engagement with it may be adversely affected. Tutors need to ask questions of students to encourage dialogue; without such questions dialogue may not happen. In turn, this has consequences for student learning, precisely what feedback is trying to enhance, and there may also resource implications. Other more dimensions of feedback as dialogue include power relations (Long, 2013) and the pedagogic and interpersonal style of each tutor. Thus, feedback dialogue has nuances that can impinge on messages understood by the recipient, irrespective of that which was intended. Providing support for students and tutors to better understand how to engage in effective dialogue would be a valuable contribution that HEIs could make in their feedback requirements. Increasing the use of effective dialogue will be addressed in Chapter 9.

Dialogue (Fryer, 2004) is central to effective feedback (Higgins, Hartley and Skelton, 2001), and ideally should be face-to-face (Pettinger, 2012). Modern technology facilitates electronic communication (Hamilton and Webster, 2012) which for students means they are able to access resources and communications at any time when on or off-campus. Such on-line resources are particularly valuable. Despite the learning opportunities these on-line resources offer they do not diminish the value of human interaction for effective learning, but do open new avenues for students' learning activities. However, in the current economic and political environment providing face-to-face feedback dialogue represents a considerable burden on institutional resources (Bloxham and Campbell, 2010), meaning on-line resources are all the more valuable.

The object of feedback dialogue is to help learning and encourage students involved with the feedback process to monitor and reflect on their own progress (Ball, et al., 2012). This may be further enhanced through self-regulation, a form of self-feedback. Evans (2013) finds the concept of self-regulation poorly defined, whereas Nicol and Macfarlane-Dick (2006) consider it provides a valuable framework for understanding how students may improve their level of attainment. Becoming self-regulated learners is an important part of student progress through higher education and concerns students being able to have "active monitoring and regulation of a number of different learning processes" (Nicol and Macfarlane-Dick, 2006, p.2). Self-regulation is to be encouraged for students, although not an easy skill to develop.

A similar concept is reflection. Kolb (1984) and Schön (1983) both consider reflection important in learning and the creation of reflective learners, which in turn helps the individual's development as an effective practitioner. Schön (1983) critiques practitioners' reflection on their knowledge and experience when faced with problems to resolve, and notes that such reflection is a valuable route to being a more effective practitioner, synthesizing Mode 2 tacit and Mode 1 formal knowledge.

Self-regulation and reflection are valuable, in both an educational setting and in professional practice. Not helping students develop such skills represents a missed opportunity to enhance students learning and development, with the implications this carries for their own development as effective practitioners and their value for industry.

2.5 Professional practice

Students are preparing for work in professional practice as professionals. A 'professional' is defined as "■ adj. **1.** relating to or belonging to a profession. ► worthy of a professional person; skilful or competent. **2** engaged in an activity as a paid occupation rather than as an amateur. **…** ■ **n.** a professional person. ► a person having impressive competence in a particular activity" (Oxford University Press, 2006, p.1145). This dictionary definition of professional embodies a number of themes including a high degree of skills competence, being undertaken for a living and of high standing. Leighbody (1953) identifies 16 characteristics that a professional would possess, including not requiring close supervision or direction, continually seeking self-improvement, contributing to the profession, and sensitivity to problems of colleagues. Gavurla (2005) argues that a professional demonstrates trustworthiness, helpfulness, and caring. The CIOB expects candidates for membership to demonstrate proficiency in the areas of occupational competence, management competence, and commitment to professionalism (CIOB, 2017). The RICS requires "all members must demonstrate that they:

- Act with integrity
- Always provide a high standard of service
- Act in a way that promotes trust in the profession
- Treat others with respect
- Take responsibility"

(The Royal Institution of Chartered Surveyors, 2012).

Thus, it can be seen that there is no widely agreed definition as to what being a professional means or incorporates and that PSRBs each require demonstration of specified attributes from prospective members.

Although some PSRBs may modify their direction towards a more market-oriented approach (Clegg, Kornberger and Pitsis, 2011), their authority seems likely to remain. Such institutional regulation provides a normative frame of reference for members, and a cultural-cognitive system (Scott, 2008) which may be an important influence on expected behaviour. Accredited courses offer students the possibility to join relevant PSRBs, with the benefits and responsibilities which this confers. This membership includes expected norms of professional behaviour and standards, and so it is important that students are supported in their course to develop these norms.

For the individual, securing membership of one of the built environment PSRBs considered in this thesis requires the applicant to provide evidence of theoretical knowledge and practice-based proficiency. Demonstrating theoretical Mode 1 knowledge and practice-based Mode 2 effectiveness is required in a number of other professional fields of activity. To become a registered optometrist requires the applicant to gain an approved BSc (Hons) in Optometry at a lower second class standard or better, successfully demonstrate practice-based competencies and complete pre-registration training in professional practice with work-based assessment and final competency assessment (General Optical Council, 2019). To become a nurse, the individual must have an approved degree in nursing and this incorporates clinical practice (The Nursing and Midwifery Council, 2016). To qualify as a solicitor, The Law Society (2016) requires individuals to successfully complete the academic stage of training or achieve a recognised law degree, successfully complete the Legal Practice Course and vocational training in professional practice. Chartered accountants may qualify either through a graduate route or through a professional experience route; each route requires the candidate to demonstrate academic achievement and professional practice competence (ICAEW, 2016). Common to becoming a member of any these PSRBs and being able to practice as such is the combination of academic achievement and professional practice competence that candidates for membership must demonstrate. Thus, the influence of PSRBs may be seen as they determine and regulate standards of entry into their profession (QAA, 2015).

Not all areas of professional activity require that the individual is a member of the relevant PSRB. Membership of the Chartered Society of Forensic Sciences (CSFS)

requires individuals to have a minimum of three years relevant professional experience and relevant qualifications (The Chartered Society of Forensic Sciences, 2017). But it is not necessary to become a member to practice in all areas of that field, although membership may confer the benefit of enhanced career prospects. In built environment disciplines it is not always necessary to become a member of a PSRB to operate as a practitioner, as not all areas of activity require PSRB membership. As a consequence of this, not all students in the Department seek membership of the relevant professional body following graduation. However, for some students in the Department, PSRB membership is imperative and will significantly influence their career trajectory. Some students might not undertake any further formal learning, nor have any duty to undertake continuing professional development; for other students in the Department, academic success and becoming an effective practitioner are central to their career aims. Therefore, it is all the more important that courses in the Department effectively develop students' professional knowledge and skills.

Professional practice is concerned with specific competencies and attributes for practice in a given industry, and as Cheetham and Chivers (1996) note, a professional practitioner requires attributes in a range of areas. In professionally recognised built environment undergraduate courses, knowledge and skills required are often concerned with problem-solving, and require deployment of Mode 1 and Mode 2 knowledge and skills. Developing undergraduates' higher level knowledge and skills remains a goal of HE, as effective practitioners need to have effectively developed knowledge and skills. Assessment should, therefore, integrate development of academic knowledge with development of students' professional practice skills. How professional practice is included in courses will be explored in Chapter 5 of this thesis.

2.6 Summary of this chapter and research implications

This chapter has examined issues germane to this work - learning, assessment, assessment feedback and professional practice. These integrate through use of authentic assessment to develop students Mode 1 and Mode 2 knowledge and skills. Authentic assessment offers scope for students to develop knowledge in each of Bloom's domains – cognitive, psychomotor and affective. Authentic assessment is the glue that holds these together for students learning and development, and feedback supports students learning.

The role of authentic assessment is of paramount importance. It offers potential to encourage students to develop their employability skills and professional practice effectiveness as well as their academic knowledge. In short, students develop their Mode 1 and Mode 2 knowledge and skills. Enhancing learning through authentic assessment and with an effective feedback dialogue has the opportunity to add considerable value to the student learning experience and better prepare students for their personal professional practice.

Implications of this chapter for this work are the need to examine how, assessment can be made more authentic to professional practice and, allied with assessment feedback, enhance built undergraduates learning experience. For built environment courses the current economic and political uncertainty reinforces the need for HEIs to efficiently and effectively deliver courses that support undergraduates' development of their professional practice knowledge and skills. Authentic assessment design with allied feedback offers potential to contribute to this goal.

The following chapter details the research design, methodology and methods for this thesis.

Chapter 3 Research Design, Methodology and Methods

3.1 Introduction and overview of this chapter

The previous two chapters were literature-based and explored theoretical perspectives of learning and knowledge, assessment and assessment feedback, and how these link with professional practice. The purpose of this chapter is to examine, select and justify the research design. This chapter and the following one act as a bridge between underpinning theoretical chapter and the data-based chapters.

Research design is the means by which goals of the research may be achieved (Flick, 2014), and explains the plan to select, gather and analyse data (Gray, 2014). This chapter first identifies the philosophical position taken as this underpins the methodological approach, which is anti-positive and interpretive, and data gathered is qualitative. Having established this, the chapter goes on to explore potential methodological routes to investigate the problem and then explicates the choices made. This is followed by a discussion of ethical issues and how they are addressed in this research. Next, practical methods for selecting, gathering and analysing data are discussed. This research concerns activities and perspectives of humans, which necessitates gathering qualitative data and in turn has implications for how data is analysed. Next, the chapter deals with quality issues for the research, as quality is key to realising the value of the research. There is then a preliminary study to evaluate and refine the research instruments and confirm the need for and direction of this study before conclusions of the chapter.

Research in the real world may be applied and have practical application (Gray, 2014), which is the object and value of this research and of this DProf because it seeks to contribute both to knowledge and to practice. The desire to improve practice in order to solve the problems identified (Chapter 1) generated the following central research question and four research sub-questions.

> **Central research question**
>
> How can assessment be made more authentic to professional practice and, allied with assessment feedback, enhance built environment undergraduates' learning experience?

Research sub-questions

1. How is professional practice included in courses?
2. How can professional practice be made explicit in assessment?
3. How can feedback on assessment be designed and used to reinforce learning in the context of professional practice?
4. How can students gain the most value from feedback on assessment in relation to their personal professional practice?

Courses in the Department seek to develop students as practitioners. All courses except one are accredited and all seek to provide a relevant learning experience. However, evidence suggests that this is not achieved as well as might be desired, and that in particular there is concern regarding the extent to which assessment and assessment feedback support students' learning and preparation for industry. The research sub-questions are designed to examine the means by which these concerns may be addressed.

3.2 Philosophy

3.2.1 Discussion

Drawing from literature, the philosophical position taken in this research is identified to provide a lens to examine the problem under investigation (Newby, 2014). The reason for this, as Crotty (1998) rightly points out, is because philosophical assumptions shape the direction for conducting research – philosophy, theoretical position, methodology and methods are interconnected. Stating these assumptions here elucidates implications for methodology (King and Horrocks, 2010) and choices made.

Epistemology concerns the nature and validity of knowledge (Wellington, 2015). Epistemological assumptions the researcher makes have consequences for what is an appropriate research methodology (Cohen, Manion and Morrison, 2018; Bryman, 2016). A positivist epistemology has its origins in the work of Auguste Comte (Flick, 2014) who emphasised social science should deal with observable facts that can be measured or observed while the researcher remains aloof from the phenomena under investigation (Fellows and Liu, 2015). Positivists consider the natural world objectively, as external to the individual (Wellington, 2015) and reality as independent of the researcher (Gray, 2014). The key strength of a positivist approach – its concern with measuring and objectivity – is also its weakness: that it has limited efficacy in studying

human behaviour and nature (Cohen, Manion and Morrison, 2011), which are not measurable in the same way. Therefore, as this research is concerned with human behaviour, a positivist stance with its emphasis on measurement and objectivity is inappropriate.

In contrast with the positivist approach, an anti-positivist epistemology is concerned with understanding the social world as it is constructed and interpreted by humans (Amaratunga, et al., 2002), each individual shaping their own ideological position (Dash, 2005). This paradigm is particularly relevant here as it examines actors' perspectives (Fraenkel and Wallen, 2000) regarding particular social phenomena (Creswell, 2014) in a higher education setting. Interpretive research (Walliman, 2011a; Denzin and Lincoln, 2013a; Newby, 2014) is a broad term that includes a range of approaches to investigate social phenomena (Merriam, 1998). It explores "complex social processes" (Curry, Nembhard and Bradley, 2009, p.1442), concepts and ideas communicated (Newby, 2014), and meanings people attribute to social interactions or events (Travers, 2001; Snape and Spencer, 2003; Donley, 2012; Willig, 2013).

This work is concerned with uncovering people's experiences and views (Gray, 2014). It concerns investigation of a natural setting as people experience and perceive a phenomena (Denzin and Lincoln, 2013b). Interpretive approaches provide a sound basis for examining people's views concerning assessment and assessment feedback in the Department. Interpretive research recognises that bias exists in all human endeavours, and such an approach requires the researcher to challenge and question their own interpretations (Marshall and Rossman, 2016). Therefore, in this thesis the researcher's own involvement with the phenomena is clarified and was made explicit in Chapter 1.

3.2.2 Implications for this research

Implications for this research are to design a methodology with relevant methods to gather data from the interpretive paradigm and which allow the researcher to examine and interpret human activities and meanings attached to those activities. This work moves from observation and data gathering to creating theory (Pathirage, Amaratunga and Haigh, 2008) and is inductive (Walliman, 2011b). The object of this is to solve a real world problem practice-based problem, which has implications for how the work is conducted.

This research, undertaken at ARU, should be of interest to those involved with delivery of undergraduate built environment or other professionally accredited courses. Findings of this work intend to identify routes to use assessment and assessment feedback to more effectively support built environment undergraduates' academic learning and their development as effective industry practitioners. These findings will be of benefit to students, the Department and industry, because understanding how to provide authentic assessment will in turn support students preparation for industry as professional practitioners.

3.3 Methodology and methods

3.3.1 Choice and justification of methodological approach

Research methodology provides reasons for the choice of research approach (Clough and Nutbrown, 2012) and shapes the approach to questioning and discovery (Fellows and Liu, 2015). As well as philosophical influences, there are practical research issues to consider and opportunities to exploit or create. The over-riding need is to effectively and efficiently produce sufficient high-quality data in order to investigate the problem under study.

The anti-positive, interpretive paradigm offers a range of methodological choices (Taylor and Bogdan, 1984) to explore the problem under investigation, although not all are appropriate for this research. These choices in turn impinge on methods of data gathering. For example, ethnography emphasizes understanding the cultural nature of a setting (Morgan, 2014). Ethnography is inappropriate in this research because it would not yield appropriate data regarding assessment and assessment feedback. Rather than produce an in-depth ethnographic description of culture (Verma and Mallick, 1999) in a particular setting, this research is concerned to understand particular issues in a particular setting.

Naturalistic qualitative data (Denzin and Lincoln, 2013a; Gray, 2014) is gathered for this research. Such data can be an effective source of information, diverse types of data may be gathered (Gray, 2014) and will be appropriate for this anti-positivist, interpretive (Travers, 2001) thesis. The concern lies with perceptions of reality (Collis and Hussey, 2003; Gomm, 2008), examining human experience of the phenomena as individuals interpret it and to which they attach meaning (Manen, 1990; Travers, 2001; Dash, 2005) in a higher education setting. The value of qualitative data is its usefulness

for examining human perceptions and interpretations, which are central here. Student, staff and employers' views will provide a key part of the data. That is, how people experience the world around them (Newby, 2014), their perspective of a particular experience (Creswell, 2014). In particular, the lived experience of undergraduates and tutors in the Department in respect of assessment and assessment feedback in relation to professional practice are examined. By gathering the perceptions of students, staff and employers, the researcher will be able to evaluate pertinent issues to understand the problem being investigated.

Two particular methodological approaches offer potential for the qualitative data gathering required; action research and comparative case studies. Each of these will now be discussed.

Action research emphasizes exploration of the subject, reflection (Fernie and Smith, 2008) and change to practice, with the goal of improving practice (Elliott, 1991; McNiff and Whitehead, 2010). Thus, action research offers a potential route to gather and analyse data, reflect, to modify practice and review modifications made to practice (Cohen, Manion and Morrison, 2018). Action research is "creating knowledge of practice" (McNiff, 2013, p.91), which is appropriate for a DProf which seeks to understand perspectives of practice and gain insight as to how improvement may be made to practice. Action research requires the researcher to have some control over the setting (Reed and Procter, 1995), and the setting here is that of the researcher's day-to-day activities. As such, it offers a potential route to facilitating change (Robson, 2002) and for improvement (Pasmore, 2006) to practice. Action research is also appropriate as it fits the ethos of a DProf, with emphasis on changing practice to solve a real-world problem.

Action research is not without its limitations. Context specific research with limited generalizability (Gray, 2014) and researcher bias (McKay and Marshall, 2001) have been raised as criticisms, and these are addressed in Section 3.3.3 and Section 3.6.1. A positivist research paradigm, from which perspective criticisms of action research rigour have sometimes been made (Denzin and Lincoln, 2013b), is different from the anti-positivist research paradigm. Using the same criteria to critique methodological approaches drawn from these two paradigms is not appropriate because the two are entirely different. Such criticisms do not render action research as invalid, but draw attention to concerns that must be addressed in the research design. Anti-positive research recognises that all human endeavours involve some bias. However, this

argument concerning bias ignores that bias must be embedded in the design of positivist research as it is designed by humans, rendering such an argument concerning bias as being misguided. It is not appropriate to consider bias a weakness but instead it is important to ensure research design is robust and is conducted effectively, meeting trustworthiness criteria (Gray, 2014).

A possible criticism of action research concerns the small scale of such investigation with consequent limited scope (Costello, 2011). To design a large-scale study would require considerably more resources than were available to the researcher. It is necessary to have a research design that proves effective in addressing the problem under investigation. Therefore, the design of this study seeks to be achievable within the constraints placed upon it, be practical to conduct and to be of robust design.

Following initial identification of a problem, action research moves from gathering background information, designing the study, gathering data, analysing and interpreting the data, sharing findings and then re-starting the cycle (Figure 3.1). The cycle is repeated with a revised plan of action for change. Action research is an iterative process (Ivankova, 2015). It offers the researcher opportunity to revise practice in light of previous cycles as the research progresses and the cycle begins again (Efron and Ravid, 2013). For this study, which is concerned with solving a real-world problem, this cycle demonstrates how action research gives the opportunity for the researcher to engage with the phenomena identified, analyse and interpret data, then instigate change to practice.

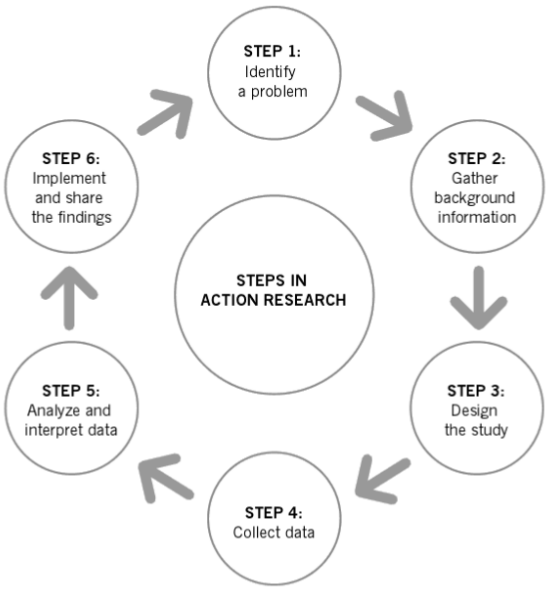

Figure 3.1 The six cyclical steps of action research (Efron and Ravid, 2013, p.8)

This work examines a particular case - the built environment undergraduate assessment and assessment feedback learning experience in the Department. However, a second approach, comparative case study methodology, is also appropriate. By combining comparative case study with action research, the work benefits from comparison with other areas within ARU to generate insight and ideas. Action research and case study are close on the methodology continuum (Newby, 2014) and share some data gathering techniques. These complimentary approaches sit well together and both are used.

Action research and case study are each concerned with examining a particular case or setting. Where action research seeks to embed change within the research cycle, the object of a case study is to gather insight into the particular social problem under investigation (Fraenkel and Wallen, 2000; Swanborn, 2010), to investigate in depth a particular case or setting (Flyvbjerg, 2013), to develop a rich understanding of the phenomena (Newby, 2014) and understand linkages over time between the elements under study and within the “real-world context” (Yin, 2018, p.15). Yin (2018) also argues case study research is valuable when how or why questions are asked regarding contemporary events which the researcher cannot control. The intention in case studies is to make use of a range of data gathering techniques appropriate to both the setting and the nature of the work (Swanborn, 2010). As action research, this research intends to modify practice in the Department, although there is no intention to

disturb the setting of the comparative case studies. The case studies contribute to the thesis by offering comparison which helps provide insight into the phenomena under investigation (Goodrick, 2014) by examining practice in other areas and so may generate ideas for modification to practice in the Department.

Comparative courses used were the BOptom (Hons) Optometry and the BSc (Hons) Forensic Science at ARU to help provide insight into the problem (Chapter 1). It was decided to use these courses for comparison as this would provide sufficient data without there being too many courses so as to make data gathering impractical. Both of the comparative courses are PSRB accredited, as are most courses in the Department. Use of a non-accredited course would have omitted an important influence on course design, which was part of this study. These courses were in the same Faculty as the Department, which was important because it meant that all courses in this study used the standardised module guide template, which provided a degree of consistency in a key area of interest in this study.

These comparison courses – forensic science and optometry – were included in the case studies but not the action research. Nevertheless, ideas gained from these courses would provide useful insight into the issues under investigation and so help to generate ideas for modifications to practice, and the use of two courses offers an important contrast with the Department (Yin, 2018).

In respect of methodological approach, using a single approach throughout would not have provided the valuable insight into the learning experience of students on different accredited courses within the same Faculty which generated ideas and helped inform the action research. Therefore, using two approaches was essential in this study and it was necessary to have each in order to effectively explore and address the problem under scrutiny.

Implementation of the action research is detailed in Chapter 4. The action research activities are contained in Table 4.1, and are derived from the activities identified by Efron and Ravid in Figure 3.1.

3.3.2 Methods of gathering data

The methods used were to allow the researcher to gather data that focused on the key issues of this study. All data gathering methods have advantages and limitations. It is,

therefore, helpful to have more than one method in order to compensate for potential deficiencies. As anti-positive interpretive research seeking to gather qualitative data, the choice of method was informed by the need to gather data that allowed for examination of the phenomena under investigation. It was necessary for the researcher to be aware of limitations and their implications for claims that can be made regarding findings. Table 3.2 identifies justification for and limitations of qualitative data gathering techniques used.

Having identified strengths and limitations of data gathering techniques, Table 3.3 shows each research sub-question with corresponding methods of data gathering techniques used. A literature review is included for each to provide background information regarding what is already known about each particular topic.

Table 3.2 Methods of qualitative data gathering along with justification for and limitations of each technique

Data gathering technique	Justification for use of the technique	Limitations of the technique
Thematic analysis of documents	Thematic analysis is flexible and allows patterns to emerge from data (Braun and Clarke, 2006). Documents are 'authentic' in so far as they were not created for the research. Provides valuable background information prior to focus groups and interviews, helping anchor the conversations and representations of reality. An inductive approach means themes emerge from the data (Gray, 2014).	Data analysis may become descriptive rather than analytic (Gray, 2014). Might not illuminate perceptions of the actors in the setting, which is central to this thesis as it relies on interpretation by the researcher.
Interviews	Interviews are appropriate to gain insight into people's opinions and experiences (Denscombe, 2007). Interviews are particularly valuable for exploring attitudes and also allowing for the possibility to examine a point in more depth or ask for clarification (Gray, 2014).	Interviews will have by necessity a small number of participants, and so may not be representative of the population. Interviews need to have a clear link to research questions (Wellington, 2015).

	Interviews are suitable for small-scale work (Gray, 2014). Unstructured interviews allow the respondent more scope to discuss what matters to them (Corbin and Strauss, 2008).	A research interview may contain an unequal power balance and bias (Creswell, 2014), thus the need to avoid this through careful design and execution. Highly standardised interview to allow for repeatability but gives little flexibility and may constrain the interview (Fraenkel and Wallen, 2000).

Focus groups	Focus groups are important techniques to gather qualitative data and provide scope to understand social reality (Donley, 2012). They allow the researcher to explore attitudes and experience (Gray, 2014). Focus groups emphasise joint construction of meaning (Bryman, 2016). They provide views of those who are representative of beneficiaries of this research. Focus groups are valuable to explore a topic (Puchta and Potter, 2004). Allows collection of rich data, and the researcher can delve deeper into particular issues as they arise.	There is the potential problem of one person dominating the group. Discussions can go in any direction, including off the subject (Gray, 2014). It may be difficult to recruit participants. Lacks the confidentiality of one to one interview (David and Sutton, 2011). Finite time means questions or topics have to be limited in number (Patton, 2002, cited in Flick, 2014). Participants may give a 'performance' appropriate to the setting and their role within it (Goffman, 1959), which might mean what they say is not entirely candid.

Table 3.3 Research sub-questions and data gathering techniques used

Research sub-question	Data gathering techniques used
1 How is professional practice included in courses?	Literature review. Thematic analysis of Professional, Statutory and Regulatory Body (PSRB) accreditation documents, Course Specification Forms (CSFs) and module guides. These documents are those used for the courses under investigation.
2 How can professional practice be made explicit in assessment?	Literature review. Interviews tutors and employers, and focus groups with students. Following changes to practice, interviews with tutors and employers, and focus groups with students.
3 How can feedback on assessment be designed and used to reinforce learning in the context of professional practice?	Literature review. Written assessment feedback to analyse what is provided. Focus groups of students and tutors. Following changes to practice, interviews with tutors and employers and focus groups with students. Final analysis of course documents to assess changes to assessment and assessment feedback practice.

4 How can students gain the most value from feedback on assessment in relation to their personal professional practice?	Literature review. Focus groups of students. Interviews with employers. Following changes to practice, interviews with tutors and focus groups with students.

The starting point was to gather data from documents to establish current practice. This data was gathered from PSRB accreditation documents, Course Specification Forms (CSFs) and module guides. These documents were not produced for this research, but were made for other specific purposes (Flick, 2014), are relevant to this study, may be considered authentic, and carry the advantage of not being influenced by the researcher. Documents are important human creations and provide data which can be gathered unobtrusively (Gray, 2014) and insight into human activities. However, it is recognised that these documents were written for a particular audience and purpose which may have coloured what was written (Flick, 2011). Therefore, documents should be evaluated with this in mind.

Interviews may be undertaken from a range of philosophical positions (Roulston, 2010) and are often used to gather qualitative data (Donley, 2012). Interviews may range from highly structured with pre-determined questions to highly informal conversation style of approach with issues to raise rather than questions to ask (Cohen, Manion and Morrison, 2018). Conducting informal interviews offers the opportunity to explore areas in depth, allowing the researcher to probe any areas of uncertainty and facilitating clarification by the respondent (Gray, 2014). Disadvantages of interviews include securing participants' trust, maintaining confidentiality, and the time-consuming nature both of conducting interviews and analysing data. In this research, trust was enhanced by explaining to participants that they were experts in the subject, whereas the researcher was not because she did not have their knowledge, and it was understanding this that was the object of the interview or focus group.

Focus groups have many benefits, including the opportunity to probe issues deeply, and for people to add to and develop comments made by others in the group (Gray,

2014). But focus groups also have potential difficulties, including possible dominance of the group by one person and views of more timid participants being neglected. Consequently, the researcher must take care to ensure the voice of each participant is represented (Yin, 2018). Therefore, when using focus groups the researcher remained vigilant to these difficulties and ensured all participants' voices were heard. For example, drawing individuals into the conversation by asking each participant in turn for their response to a question.

3.3.3 Being an insider-researcher

The researcher is a practitioner within the Department, an insider to the problem under examination. The insider perspective is an important part of understanding a situation (Bartunek and Louis, 1996) and is acknowledged in interpretive research (Huberman and Miles, 2002; Walliman, 2011a). Explicating the perspective of insider-researcher is necessary, so that the reader can appreciate the researcher's perspective and form their own judgement of the work. Therefore, the insider perspective is recognised in this thesis. Implications of this are the need for clear explication of the researcher's perspective to inform the reader and who may then form their own judgement regarding choices made and their potential consequences. For that reason, the researcher's background and interest in this work were provided in Chapter 1 and Chapter 4 details the action research with the researcher's thought processes as the work unfolded.

Researcher reflexivity when investigating human activity is essential (Ellingson, 2013), is necessary to explicating the lens through which the researcher views the world (Travers, 2001; Alasuutari, 2004; Etherington, 2004), and considers participants' feelings and interpretations (Oliver, 2005). Internal reflexivity (May and Perry, 2011) made clear for the reader enhances integrity and trustworthiness of the research. Reflexivity emphasises the researcher engaging "in *critical self*-reflection: reflecting critically on the impact of their own background, assumptions, positioning, feelings, behaviour while also attending to the impact of the wider organisational, discursive, ideological and political context" (Finlay, 2008, p.6). The context of choices made is clarified for the reader (Mruck and Breuer, 2003) and reflexivity to better understand the process by which participants' feelings and interpretations (Oliver, 2005) are explicated. Reflexivity also serves to remind the reader that outcomes of research are constructed from choices made during the research process (Mruck and Breuer, 2003), choices made by the researcher. It is, therefore, important that the researcher reflects on the research process as it progresses and challenges their own perceptions and

influence on the research. Chapter 4 explains how the thought processes of the researcher influenced the introduction of changes in each cycle of action research at each point of the process.

Crotty (1998) makes the case for insider-researchers to 'bracket themselves out'. Bracketing is concerned with the researcher being aware of their pre-conceived ideas, and mitigating these to prevent the research process becoming distorted (Tufford and Newman, 2010). Arguably bracketing, like reflexivity, requires the researcher to explicate their own viewpoint. However, the weakness of this is that each individual can never fully know their own position or viewpoint. All human endeavours carry bias and, therefore, bracketing would be more appropriately designed as the researcher explicating, so far as they know it, their own perspective. Clarifying this for the reader includes "their background, biography, values and preconceptions … and an account of how these may have changed over the course of the study" (Seale, 2018, p.20). These are provided in Chapter 1 and Chapter 10 of this thesis.

The rationale for reflexivity in this thesis lies in concern that insiders in research may take a different – biased - view of the subject from outsiders (Bartunek and Louis, 1996) which would then compromise the integrity of the research. This suggests that the outsiders view is more valuable than that of insiders, and also ignores the point that each of these views must, by necessity, contain some degree of bias. Instead, it is important that the research develops shared understanding of the phenomena under investigation and interpretation (Fischer, 2009).

3.3.4 Implications for this research

It was important to ensure that the researcher proceeded with care, following the methodological protocols in order to ensure data gathering was effective. The research was undertaken with awareness of the influence the researcher might unwittingly exert over the research process and consequences of that would carry. The researcher kept a short reflective personal diary during the course of undertaking this research, which was used to facilitate reflection on the researcher's perspective which evolved during the course of the study.

3.4 Ethical issues

Ethics is defined as "**1** [usu. Treated as pl.] the moral principles governing or influencing conduct. **2** [usu. Treated as sing.] the branch of knowledge concerned with moral principles" (Oxford University Press, 2006, p.490). Research ethics is concerned with "the moral principles guiding research from its inception through to completion and publication of results" (The British Psychological Society, 2014, p.5). The important point of the ethical dimension of research is to ensure no harm – physical, psychological or otherwise – can happen to participants (McNiff and Whitehead, 2002) or any other parties. The researcher has successfully completed ethics training as required by ARU which helped develop awareness of ethics issues, identify potential areas of ethical problems and determine how they may be resolved. Sound ethical practice has advantages that stretch beyond the ethical dimension, protecting participants and the researcher, as well as strengthening the research design.

To guide development of sound ethical practice in this research a number of activities were undertaken. First, there was compliance with the Anglia Ruskin University ethics approval process (Anglia Ruskin University, 2014). This required approval of the ethics application by the Department Research Ethics Panel (DREP) and this was confirmed by the Faculty Research Ethics Panel (FREP). The role of such research committees is to ensure "dignity, rights, safety and well-being of the people who take part" (Involve, 2015). Following submission of the ethics application in respect of this thesis, approval was granted for a period of three years, the ARU standard duration of approval, on 29 May 2015 (Appendix C). A further application was made to accommodate the original work plus production of a research paper which gathered data outside the confines of the original application but which was integral to this research. This second application was approved with effect from 7 November 2016 (Appendix D). Second, The British Psychological Society (2014) Code of Human Research Ethics was followed. This required the researcher to avoid "potential risks to psychological well-being, mental health, personal values, the invasion of privacy or dignity" (The British Psychological Society, 2014, p.11).

Much written data was available publically or widely, and for other material permission to gather and use it was first secured from relevant stakeholders. For data gathered from focus groups or interviews, a more lengthy process was involved in meeting ethical requirements.

Immediately prior to starting each focus group or interview, all participants were provided with clear information regarding the nature and purpose of the study verbally by the researcher and also via the ARU Participant Information Sheet (Appendix E). They were given opportunity to ask questions so they could make an informed decision as to whether or not to proceed (Speers and Lathlean, 2015). It was explained that participants would have opportunity to check for accuracy the transcript of their focus group or interview and/or the interpretation of the data should they so wish. Also it was explained that only anonymised results and a small number of anonymised illustrative examples of data would be written into this thesis, and it would not possible from these to identify any person or organisation. Time was allowed for participants to read this paperwork, ask any questions they may have and receive appropriate responses. Participants were also provided with the ARU Participant Consent Form (Appendix F) at the outset of each focus group or interview. If they were willing to proceed they then signed the Participant Consent Form and returned it to the researcher. All participants except one proceeded, and the researcher thanked that individual for their time, after which they departed. Security was achieved through anonymous recording of spoken data and storing it with password protection. Confidential electronic data is to be deleted upon completion of this work. Paper-based data is stored securely and is to be destroyed through the ARU shredding facility upon completion of this project.

It is important in action research that participants are made aware of the researcher's dual role as researcher and practitioner, and how it may impinge on others (BERA, 2011). Consequently, it was clarified to students in the class with modified assessment and to tutors in the Department what the researcher was trying to achieve. Permission to gather data was secured at the outset from the gatekeepers, the Head of Department and course leaders (Saunders, Kitzinger and Kitzinger, 2015).

For each interview or focus group that was conducted off-site from the Chelmsford campus the researcher placed details of the date, time, location and contact information in their Outlook calendar. This information was available for the researcher's supervisor and spouse, who each had access to the researcher's calendar. This was appropriate to address concerns around risk in the event of emergency or unanticipated problem so that the researcher's location was known.

The initial study for focus groups and interviews included an ethics pilot (The British Psychological Society, 2014). Subsequently data gathering was modified to emphasize to participants the purpose and value of their contribution to the study. Participants

were informed they were experts in the subject under investigation and the researcher was not, hence participants' candid views were vitally important. This was to help participants understand the value of their contribution and to put them at their ease as the researcher perceived that some participants were a little apprehensive (Chapter 3, Section 3.7). The researcher considered this modification was valuable, both from ethics and data gathering perspectives, as participants understood the value of and need for their contribution and also appeared more relaxed. This was also integral to the researcher's reflexive approach which was necessary in this research.

3.5 Data selection, collection and analysis

3.5.1 Documents used and sampling strategy

Data was of two types, written material and spoken. Written material was selected that was central to course design, operation and ultimately contributed to students' learning experience. Use of these documents facilitated analysis of the area under investigation from different perspectives (Rosenberg, Heimler and Morote, 2011). Analysing these documents together was an exercise that has not otherwise been undertaken in the Department. The rationale for selection of these documents was that they were produced for particular purposes, underpin students' learning experience and have advantage of not being manufactured for the purpose of research (Silverman, 2014); as Gray (2014, p.511) notes, they are already exist and are not produced in response to this research. They form an important part of the subject under investigation and are important 'social facts' (Atkinson and Coffey, 2004) that have credibility as sources of information. This examination of the *status quo* allowed the researcher to understand the current situation and using this information identify an appropriate course of action to be taken for the subsequent action.

3.5.1.1 Documents selected

Documents selected were as follows. First, PSRB course accreditation documents.

- Built environment PSRB accreditation documentation analysed were those of the following bodies.
    - Architects Registration Board (ARB)
    - Chartered Institute of Architectural Technologists (CIAT)
    - Chartered Institute of Building (CIOB)
    - Joint Board of Moderators (JBM)
    - Royal Institution of Chartered Surveyors (RICS)

- PSRB accreditation documentation analysed for the comparative case studies were those of:
    - Chartered Society of Forensic Sciences (CSFS)
    - General Optical Council (GOC)

The PSRB documents identify requirements and expectations of accredited courses. PSRB requirements can exert considerable influence on course design. Anecdotally, it is considered by tutors in the Department that without accreditation, many of the courses would attract too few students to be economically viable. It was part of the ARU mission statement to increase the range of accredited courses on the Chelmsford campus (Anglia Ruskin University, 2015). PSRB accreditation of a course carries recognition of students' preparedness and education for life in professional practice (Smith, 2009); in turn PSRB requirements are influenced by industry (Cotgrave and Kokkarinen, 2010), as indeed are course designers. This illustrates the range of influences on course design and operation, with disparate contributors each having their own perspective and goals.

Second, Course Specification Forms (CSFs) for each of the courses under investigation. These are influenced by PSRB requirements and industry expectations, and contain course information. The courses are listed below.

- From within the Department were:
    - BA (Hons) Architecture
    - BSc (Hons) Architectural Technology
    - BSc (Hons) Construction Management
    - FdSc Construction
    - BEng (Hons) Civil Engineering
    - BSc (Hons) Civil Engineering
    - FdSc Civil Engineering
    - BSc (Hons) Building Surveying
    - BSc (Hons) Real Estate Management
    - BSc (Hons) Quantity Surveying
- The comparative case study courses were:
    - BSc (Hons) Forensic Science
    - BOptom (Hons) Optometry

CSFs are approved through the formal ARU validation process. At ARU, the structure and ILOs of course are recorded on CSFs which are designed to demonstrate

“academic coherence within the course” (Anglia Ruskin University, 2017a, p.12). Completed CSFs provide, in a standardised format, information regarding course aims, course learning outcomes and means by which they are to be demonstrated, intended teaching methods and strategies, the position on the course of each module to be studied, assessment methods, and employability goals. These CSFs underpin the delivery of courses and student experiences. CSFs are included here as they are important contributors to the student experience.

Each course must adhere to ARU requirements regarding the volume of study to be included at each level, for example an honours degree would normally be composed of 120 credits at each of levels four, five and six (Anglia Ruskin University, 2018e). In the Department there are also PSRB requirements to meet, and the requirements of the relevant PSRB are embedded within each undergraduate course.

Third, module guides from modules on each of the above courses were examined. Module guides include assessment briefs and criteria. One module guide from each undergraduate level of study in each course under examination was selected by simple random sampling (Thompson, 2012) using random numbers to determine which guides were selected, meaning that each module guide had an equal probability of being selected, and that each course and level of study were included. It must be noted that excluded from this process were undergraduate dissertation module guides plus four other module guides as these had all been written by the researcher.

Fourth, written assessment feedback on the front coversheet of feedback produced for students on the above courses was gathered. The written feedback collected was that made available for the external examiners to view and the sample provided from tutors in optometry and in forensic science areas. These were samples of convenience (Donley, 2012), and convenience sampling is often used in qualitative research (Burnard, 2004). There may have been some self-selection in the data thus gathered, but it is considered unlikely to have resulted in bias for the analysis here. There were no grounds to suppose that tutors would have written materially different comments from those that were not to be viewed by the external examiners.

All modules required paper submission of assignments, except for one which had electronic submission. The ARU Code of Practice on the assessment of students (Anglia Ruskin University, 2013) states that feedback will be provided for all assessment submissions within 20 working days of the assignment deadline, with the

exception of major projects which are within 30 working days. There is an expectation that this summative feedback will be word processed. Tutors provided two types of written feedback. On the paper-based submission, there were hand-written annotations on the work, and general overview comments which were word-processed, printed on A4 paper and then placed inside the front of each submission. In the module with electronic submission there was a comparable arrangement, with annotations and general overview comments at the front of the work. The feedback that was the focus of this study was the general summary. The rationale for using this feedback but excluding the annotations was to analyse the comments that tutors produced when they had a blank sheet, rather than annotations produced as a critique in direct response to particular parts of students work. This narrative feedback evaluated the assignment and provided an overview of key issues that tutors considered relevant. These written comments varied in length from six words to one A4 page of typed feedback. In some modules, portions of the feedback were the same for all students and only part of the feedback being bespoke.

Together these documents represent stages in the construction of the learning experience offered to students. They are produced by different groups of people, each with their own goals and interpretation of what is appropriate.

3.5.1.2 Participants selected

The face-to-face data were collected through: focus groups of students; two meetings of focus groups of tutors; interviews with tutors; and, interviews with employers. The focus group meetings were originally for discussion concerning small modifications which had been made to courses, and this was deemed a useful and appropriate opportunity to convene a focus group meeting for this study.

Sampling for the focus groups of students in the Department was determined by the need to have students from all courses in this research, from each undergraduate level of study and full-time and part-time students. Given the complex timetabling arrangements in the Department and the fact that students attended on different days, the most practical route was to identify those classes which would meet the selection criteria and seek volunteers from those classes. The goal was to include students from each course in the Department. Those students who did participate were self-selecting (Gomm, 2009) with the attendant potential problem that they might not be representative of the population (Edwards, 1980). However, it was not possible to know

which students would have been representative of all students in the Department (Gray, 2014). In response to this, the research was strengthened through conducting focus groups at different points in time during this study so as to avoid the influence of any particular adverse time in the academic calendar and also having follow up focus groups to evaluate the findings of this study.

For the comparative case studies, access was required to be via tutors on those courses. The tutors were made aware of the researcher's need to have participants from different stage on the courses and they matched this as best they could. Students who volunteered to participate from those areas were at the mid or end point of their course.

Each focus group of students was composed of undergraduates at the same level of study. This provided some degree of homogeneity of participants within each group and so made it easier for them to talk with one another (Adams and Cox, 2008) as they had shared academic experiences.

There were 35 tutors in the Department in 2014/15. A random sample (Diamond and Jefferies, 2001) of eight tutors were invited to participate in the first interview data gathering cycle and these included tutors from each course. In the follow-up interviews after modification to practice, tutors were selected on the basis of whether or not they modified their assessment design and their perceived response to this research, a purposive sample selected because those participants would be information rich (Gray, 2014). It was appropriate to take this multi-phase approach because the criterion for this phase were different from previous requirements (Cohen, Manion and Morrison, 2011).

At the time of this study there were 11 forensic science tutors and 15 optometry tutors plus a variable number of optometry skills tutors who were practitioners and who assessed but did not teach undergraduates. There could have been a problem securing sufficient participants from the comparative courses, which is often difficult (Newington and Metcalfe, 2014). Indeed, initial responses to requests to participate were not encouraging, and this may have been because the researcher was unknown to the tutors. Therefore, from these areas, each tutor was approached individually by e-mail and invited to participate, meaning that these participants were self-selecting. From each comparison course four tutors participated, giving a total of eight.

The Deputy Head of Department who was responsible for external contacts provided the researcher with contact details of 12 employers who engaged with the university. All were senior practitioners within their own organisation. All of these employers were approached by telephone and six participated; of these six, four worked in private practice and two for a local authority.

The process of gathering the data continued until no additional themes were emerging from the data and until saturation point had been achieved (Hennink, Hutter and Bailey, 2011). In qualitative research the goal is to provide “an in-depth picture” (Creswell, 2012, p.209).

3.5.2 Data collection

This section provides detail of the data collection techniques, which in the research uses qualitative data and as such is concerned with human activities (Abbott and McKinney, 2013). This thesis contains both an initial study and a main study. To be beneficial, such initial study had clear objectives (Lancaster, Dodd and Williamson, 2002), which were to verify the need for the main study, to refine the data collection instruments as appropriate, and to facilitate development of the researcher’s skills at conducting a focus group. In respect of the data collection instruments, the objectives were to identify any deficiencies in questions asked, to evaluate management of the group by the researcher, and to identify potential opportunities worthy of further exploration and which had been under-represented or omitted from the original questions. The initial study also allowed for piloting of the ethics, which was valuable because the researcher modified her data gathering techniques as a consequence of this initial study (Chapter 3, Section 3.4). Data for the initial study was gathered within the Faculty of Science and Technology at ARU.

The researcher arrived in advance of each focus group to ensure layout of desks was in a square so that no-one participant or the researcher would be in a dominant or subordinate position. Refreshments were provided for those student focus groups which took place at lunch-time on those occasions when that was the only available time for participants. The researcher had a printed list of questions (Appendix G) to be asked as well as prompts to remind the researcher to thank the participants, to explain there was the opportunity if they wished to read transcripts and revise transcripts should there be any errors, and that they, the participants, were the experts on the subject not the researcher. On that list was added a list of areas to probe in relation to

each question if responses were unduly short or uninformative. At the commencement of each focus group it was explained to participants the goal was to share views rather than secure agreement. This was to help each participant appreciate the purpose and value of own their contribution. It was also clarified that the meeting would be recorded and subsequently transcribed with the original recording being deleted and ultimately the transcription being permanently deleted. Time was then allowed for participants to ask any questions. The ethics protocol paperwork was then completed by each participant and returned to the researcher. Participants were advised when the recorder was to be turned on, and this was in kept in clear sight of participants throughout each interview or focus group.

Interviews with tutors and employers were carried out in a similar way. The researcher ensured in advance each interview was carried out at a time convenient to the participant. As previously, protocols were explained to each participant and ethics agreement was secured prior to the start of each interview. To allow for a degree of control by the researcher but freedom for each respondent to elaborate as they wished, interviews were semi-structured. Interviews were recorded and subsequently transcribed for analysis (Flick, 2014), then checked several times for accuracy. All interviews were conducted one-to-one in private. Tutors were interviewed in a classroom or meeting room as these were neutral environments which would help put them at their ease. Employers were interviewed at their own place of work or at the university if the employer expressed a preference for that; all but two chose to be interviewed at their place of employment.

All focus groups and interviews were semi-structured. The list of questions with prompts of areas to develop was used by the researcher for each focus group or interview (Appendix G).

3.5.3 Data analysis

Data gathered for this thesis is qualitative; analysis of such data requires interpretation and is concerned with identifying patterns contained within data (Nieswiadomy, 2014). Qualitative data analysis operates on both concrete and conceptual levels involving decision-making by the researcher (Tesch, 1990). A number of analysis techniques were considered but ultimately rejected.

Content analysis did not sit well with an inductive approach, requiring categories of analysis to be derived from theory (Flick, 2011), but ignores context (Alexander, 2008) and tends to be more suited to a deductive approach (Gray, 2014). It was important in this research to examine the data free from such constraints. Interpretative phenomenological analysis at first sight offers potential. Yet closer inspection reveals this to be not entirely appropriate, with its phenomenological stance (Larkin, Watts and Clifton, 2008) and particularly small sample size (Gray, 2014). This was considered not entirely appropriate for this research and, therefore, was discounted. Narrative analysis was not appropriate because it is concerned with temporal appreciation of events or people (Bryman, 2016) and its focus on 'stories'. The object of discourse analysis, "socially meaningful" identity (Gee, 2014, p.25), is inappropriate for this work, which is concerned with understanding a particular setting and activities within it.

In contrast, sitting within the interpretive paradigm (Braun and Clarke, 2006), thematic analysis seeks to understand meanings and experiences (Christensen and Probst, 2015). This would allow for examination of a diversity of data, each of which represent one aspect of the subject under investigation, to take an exploratory, content focused approach to data analysis (Guest, MacQueen and Namey, 2012) which was the aim and permitted interpretation of the material (Boyatzis, 1998). Consequently thematic analysis was selected. Thematic analysis can be used to generate categories of themes and involves the researcher identifying relationships among the categories (Maxwell and Chmiel, 2014). However, care should be taken to avoid creating links between categories of data which may be an erroneous representation of the data. Consequently, the use of follow-up focus groups of students to establish the robustness of the findings was beneficial.

Thematic analysis is "a method for identifying, analysing and reporting patterns (themes) within data" (Braun and Clarke, 2006, p.79), and is used in analysing qualitative data (Boyatzis, 1998). An advantage of thematic analysis is that it offers flexibility in analysis and opportunity to look for meanings within the data. Thematic analysis is concerned to capture what is appropriate to this research (Vaismoradi, Turnen and Bondas, 2013) and can be used to help solve real-world problems (Guest, MacQueen and Namey, 2012). Data was, therefore, analysed through thematic analysis, which allows the researcher to represent respondents' descriptions of their perceptions (Tippens, et al., 2013); accurate representation of these perceptions was of crucial importance.

It is interesting to note that there is some debate regarding thematic analysis. Bryman (2016) considers thematic analysis difficult and with little agreement as to how themes are identified, although acknowledges its flexibility and popularity. Bryman argues that there is little agreement regarding how themes are identified. This overlooks the necessity in any piece of research for the researcher to clarify to the reader the analytical approach they used. Conversely, Braun and Clarke (2006) argue thematic analysis is a valuable, even necessary, technique for researchers new to qualitative data analysis. Thematic analysis is valuable for this research as it offers opportunity to analyse qualitative data in a way appropriate to the research goals. It seeks to encapsulate the experience constructed in the area under investigation (Cohen, Kahn and Steeves, 2000).

Thematic analysis was used inductively to obtain themes from the data (Pope, Ziebland and Mays, 2000; Burnard, et al., 2008) through an iterative process (Weisser, Bristowe and Jackson, 2015). “You know when you have found a theme when you can answer the question, What is this an expression of?” (Ryan and Bernard, 2003, p.87). The iterative dimension of the analysis allowed the researcher to reflect on and revisit the data. The analysis focused in particular on issues of professional practice, knowledge and learning. However, the researcher is not impartial or passive but active in making choices, with the inevitable bias that influences these choices. The object of the analysis is to interpret the data, offering the reader insight to the problem under investigation, recognising potential weaknesses of the analysis. Therefore, it is necessary to proceed with awareness of these potential threats to the integrity of the research and that the researcher identifies themes which are connected logically around the relevant concept (Gray, 2014).

Consideration was given to using a software package such as NVivo to help analyse data. However, it was considered that any advantage such software might offer would be outweighed by the time taken to learn how to use the software. Further, handling the data and becoming familiar with it was important and should not be removed to the level of a software package but that identifying nuances in the data should be identified through careful examination and re-examination of the data. Excel was chosen for data analysis as it offers sorting, filtering and counting features which met the researcher’s needs, and has been recognised as providing a useful tool for qualitative data analysis (Ose, 2016).

Thematic analysis contains a number of stages, although different writers advocate different stages in the process of data analysis. The exact format for undertaking thematic analysis varies, with different writers having slightly different approaches.

One approach in stages in the analysis of text is: “discovering themes and sub-themes, winnowing themes to a manageable few (i.e., deciding which themes are important in any project), building hierarchies of themes or code books; and, linking themes into theoretical models” (Ryan and Bernard, 2003, p.85). However, this approach lacks detail and could benefit from further stages in the process. Therefore, this approach was considered inappropriate as a whole, although parts offered some value.

Burnard, et al., (2008) have a more clearly defined approach, as follows:

- Open coding of the material making notes in the margin;
- Collect the words or phrases onto a clean sheet set of pages and eliminate duplication;
- Look for overlapping or similar categories – themes – and which may be informed by analytical ideas developed in the research;
- Data is then put under one of these categories found in the previous phase; and
- The research is written, and examples may be used illustrate points made,

Braun and Clarke (2006, pp.87-93) present a detailed iterative process (Novakovich, Miah and Shaw, 2017), containing six phases of analysis, as follows:

- Phase 1: become familiar with the data;
- Phase 2: generate initial codes;
- Phase 3: search for themes;
- Phase 4: review themes;
- Phase 5: define and name themes; and,
- Phase 6: produce the research.

Marshall and Rossman (2016) take a slightly different approach, as follows:

- organise data;
- immersion of the researcher in the data;
- produce case summaries and possible categories or themes;

- code data;
- interpret using analytic memos;
- look for other understandings of the data; and,
- write the research.

Drawing from the four approaches described above, the researcher considered that the most appropriate procedure would be as follows:

- read, re-read and become familiar with the data;
- put data onto an excel sheet with separate sheets for each data set, then analyse the data on a line-by-line basis, identifying emerging ideas. This would allow the researcher to see where each segment of data originated, and highlight items in the data that illustrate the emerging ideas, making judgements about each segment of data (Speers and Lathlean, 2015);
- review the list of emerging ideas and merge into a smaller number of themes;
- check and modify as appropriate;
- identify and evaluate any relationships between the themes generated; and,
- write up the work.

In this way, the analysis identifies important themes from the data which address the research question (Braun and Clarke, 2006). Data was read and re-read, as emerging ideas developed from segments of the data (Kidd, Kenny and Mckinstry, 2015) and were recorded. Reading the data iteratively (Pettigrew, Archer and Harrigan, 2016) allowed for reflection on and evaluation of the data. This was invaluable for identification and ultimate development of the themes.

Identifying what counted as a theme was a challenging and important part of this process, as themes identified would be central to findings of the research. Perceived significance was a determining factor for a term to be included as a theme. The iterative approach was necessary and continued until the researcher was satisfied that nothing more could be gleaned (Attard and Coulson, 2012) from the data. Sorting words and phrases of the data into themes, required the researcher to exercise caution and reflexivity in choices made (Bryman, 2016).

3.6 Quality issues in this research

Quality is the means by which research derives its value. In anti-positivist research, quality arises from explication of the research design and assumptions made. This work now deals with quality issues in this study (Table 3.4).

3.6.1 Trustworthiness

Trustworthiness is concerned with criteria to assess quality (Gray, 2014; Bryman, 2016). To that end, if research is to have rigour, objectivity and reliability are necessary goals to pursue (Hoy, 2010) and are part of the criteria by which in positivist approaches quantitative data is evaluated. However, this work takes an interpretive approach and gathers qualitative data. Consequently, criteria to assess trustworthiness must be those relevant to interpretive research. Table 3.4 compares conventional concepts for assessing quantitative data gathering techniques with naturalistic terms of qualitative data, and these are then discussed.

Table 3.4 Comparison of criteria for judging the trustworthiness of quantitative and qualitative research (Gray, 2014, p.186, adapted from Hoepfl, 1997, and Lincoln and Guba, 1994)

Conventional terms	Naturalistic terms	Naturalistic terms developed through…
Internal validity	Credibility	Examining the study design and methods use to derive findings.
External validity	Transferability	Exploring the degree to which findings are context bound, so assessed by examining the characteristics of sample.
Reliability	Dependability	Evaluating reliability of the study's conclusions.
Objectivity	Confirmability	Addressing the degree to which the steps of the study can be audited, confirmed or replicated.

Validity is a concept from the positivist paradigm; in qualitative data gathering this has limited value and is, therefore, inappropriate criterion to assess the value of this research (Guba and Lincoln, 1989; Golafashani, 2003). Instead, it is appropriate to consider the credibility of the overall research design. Credibility, which conventional or quantitative terms describe as internal validity, is concerned with "whether the researchers in fact see what they think they see" (Flick, 2014, p.483). "Credibility in qualitative research measures how vivid and faithful the description of the phenomenon is" (Beck, 1993, p.264). Credibility may be considered sound if participants were to recognise their views in the work (Cope, 2014), and if those involved consider the findings "meaningful and applicable in terms of their experience" (El Ansari and Weiss, 2006, p.177). Therefore, findings of this work were subject to inspection and comment by students in order to evaluate their perceptions of accuracy of those findings.

External validity or transferability is concerned with the extent to which generalizations may be made beyond the situation being explored (Flick, 2014). It can be argued that research which gathers qualitative data cannot with confidence be generalised to a wider context than the one studied (Newman and Benz, 1998). However, it is worth remembering that research such as this, with its qualitative data, has different epistemological roots and interpretations of the world compared to research which contains quantitative data. This research is concerned with one setting at one time, and does not set out to generalise to other settings. Indeed, it is fair to say that data such as that gathered for this research is unique to its spatial and temporal context, which is concerned to address a particular problem in a particular setting (Gray, 2014). There is an expectation that findings of this work may be of value to those in other similar settings having built environment undergraduates studying professionally recognized courses. Although it is context specific, such research can provide direction and may help address wider issues (Wiggins and Potter, 2007) and insight into beneficial revisions to practice that may be helpful in other settings (Sherratt, 2012). Thus, it is anticipated that a “fuzzy generalization” (Bassey, 1999, p.12) may be made, that the work may transfer to similar courses in comparable settings.

Reliability or dependability is concerned with “consistency between two measures of the same things” (Black, 1999 cited in Gray, 2014, p.154). Reliability of a case study may be enhanced by allowing other researchers to evaluate the data (Bell, 2010; Gray, 2014). In this research this is not a practical option. However, some of the early work was double-blind peer reviewed by two reviewers for conference publication. Additionally, the naturalistic concept of dependability is achieved through use of final focus groups to verify the findings. It must be remembered that in a qualitative data gathering study the object is to understand the issue under investigation as experienced by those in the setting (Creswell, 2014).

Questions regarding the potential influence of the researcher’s presence during the focus group and interviews must be recognised. However, this potential influence is unavoidable when gathering data for anti-positive research. Reliability or dependability of this study is enhanced by allowing students to comment on the researcher’s interpretation of the data (King and Horrocks, 2010). Therefore, students’ confirmation or rejection of the findings of this study is necessary and achieved through follow-up focus groups.

“Confirmability is concerned with addressing the degree to which the steps of the study can be audited, confirmed or replicated” (Gray, 2014, p.186). The positivist term for this is ‘objectivity’ (Table 3.4). Clarity in explaining the stages followed offers potential for others to replicate the study if they wish. The steps of this research can be replicated. However, it is not possible to exactly replicate this work in terms of the participants or the temporal location; changes to these aspects of the research would impinge on findings of any subsequent work. Therefore, it is appropriate to recognise this and ensure that there is focus on having an appropriate methodology and securing high-quality data (Sutrisna, 2009 cited in Sherratt, 2012).

Findings from analysis of qualitative data can be strengthened by methodological triangulation. This is concerned with use of more than one method to study the subject under investigation (Bekhet and Zauszniewski, 2012) and/or using more than one group of participants (Basit, 2010; Flick, 2014). The research uses a diversity of data gathering techniques and a number of follow-up focus groups to strengthen the findings following changes to practice. This study uses “multiple sources of evidence” (Yin, 2018, p.127) in order to corroborate the findings.

There were also follow-up focus groups of students to provide comment on the findings of the work. It was not possible to reconvene any of the original focus groups of students later in the research; some students had completed their course and left the university, those remaining had moved to a diverse range of classes having between them an assortment of days of attendance at ARU. However, the findings were discussed with focus groups composed of students from those modules which had modified assessment and feedback, and used to verify or refute the findings of this research.

3.7 Initial study

The focus group for the initial study was conducted on 21 October 2015 (Appendix I). This initial focus group was part of good research practice and also good ethical practice, effectively facilitating a pilot for the ethical aspect of the data gathering (The British Sociological Association, 2002) as well as enhancing the data collection technique. The focus group of students revealed that data gathered was indeed appropriate and valuable, and was developed for the main study. Data gathering was enhanced as follows:

- First, advising participants they were the experts rather than the researcher, had the advantage of helping put participants at ease. Some participants initially expressed surprise at this point but then understood the importance their contribution. Therefore, this was added for the main study in focus groups and interviews.
- Second, although the research questions were considered effective and so required no change, it was decided that having a small number of written prompts and also suggestions of areas for the researcher to probe would be helpful. Consequently, these were added.
- Third, the preliminary study allowed the researcher the opportunity to develop proficiency at conducting focus groups, as this was untested. Again, this was valuable for the main study. Following the focus group preliminary study, confidence and proficiency were enhanced and these attributes transferred to conducting interviews.

3.8 Conclusions of this chapter

The purpose of this chapter was to examine, select and justify the research design for this research. Included in this chapter is a preliminary study, which helped refine techniques for gathering data. This research is anti-positivist and interpretive, with methodological approach of action research with comparative case studies; data to be gathered is qualitative. The data analysis technique in this thesis is thematic analysis, which allows the themes to emerge rather than be created by the researcher.

A key goal of this research is to bring about change in practice, improvement to the setting under investigation and of potential benefit to others in similar settings. To that end, action research is particularly valuable as it allows the researcher to investigate potential solutions as well as merely exploring the problem under investigation. The use of comparative case studies also helps the research as it provides comparison with other professionally recognised courses in other areas. The initial study allowed for modification of the data gathering tools as well as confirmation of benefits of the research.

The following chapter explicates the action research as it unfolded. Next, there are four data-based chapters which present findings of this research. These then are followed

by a chapter discussing of these findings, and finally is the conclusions and recommendations chapter.

Chapter 4 Action Research Process

4.1 Introduction and summary of this chapter

Chapter three explained the research design, methodology and methods used. The purpose of this fourth chapter is clarify the cycles of action research – the activities undertaken, data collection and analysis within the action research process.

There is a summary of the action research activities in this DProf study in Table 4.1. Table 4.2 provides a summary the cycles of action research undertaken for this thesis and these are aligned with the six cyclical steps of action research (Efron and Ravid, 2013). Information of the data gathered for this thesis is tabulated in Appendices H, I, J, K, L, M, N, O, P and Q. Following initial collection and analysis of data, there was a preliminary meeting with the forensic science tutor and one with the optometry tutor (Appendix H). There were focus groups in each cycle of the action research; there were 12 focus groups of built environment students including the initial study, four of optometry students and three focus groups of forensic science students, plus two focus group / meetings of built environment tutors (Appendix I). There were 15 interviews with built environment tutors, and four each with optometry and forensics science tutors, plus interviews with six built environment employers and one with the philosophy tutor (Appendix J). Appendix K details the PSRB accreditation information that was used and Appendix L the CSFs examined. The sample of module guides selected is detailed in Appendix M, and there were 28 built environment and three each for optometry and forensic science. Appendix N is the written feedback by course area(s) for the module to which the feedback relates, and there were 52 built environment items, 27 forensic science and 17 optometry. Appendix O is the assessment briefs in the modified assessment and Appendix P is the dissertation feedback, one set from each of built environment, forensic science and optometry. Appendix Q is the feedback on the modified assessment. There are illustrative examples of raw data in Appendix R and Appendix S contains illustrative examples of data analysis, with emerging ideas - codes - and themes.

This chapter navigates the reader from the original driver to undertake this research and the findings of Stage One of this DProf through the action research undertaken for this thesis. The findings of Stage One provided the starting point and shaped the direction for this thesis. The chapter starts by examining how the problem was identified, the background information was gathered and then the study was designed.

The next section details how data was collected and analysed, then findings implemented and shared. Finally are the conclusions of the chapter.

Table 4.1 Action research activities in this DProf study

Step Academic year	Activity (from Efron and Ravid, 2013)	Activity undertaken
Step 1	Identify a problem	Feedback is evaluated as the weakest part of the student experience; evidence is contained in NSS and MES.
Step 2 2014/15	Gather background information	Examine theory and literature regarding assessment and assessment feedback.
Step 3	Design the study	Methodology - use of comparative case studies to inform action research activities.
Step 4 Step 5 2015/16 2016/17 2017/18	Collect data Analyse data	Gather data from the comparative cases and the current situation in the Department from course documents. Undertake thematic analysis of this data. Modify practice in the Department (Chapter 6). Gather and analyse data following modified practice, conduct of focus groups and interviews. Conduct further focus groups and interviews to verify or refute findings and analyse data.
Step 6	Implement and share findings	Design course toolkit. Modify course handbook. Modify assessment review protocol. Conference paper accepted for September 2019.

4.2 Identify a problem

Undertaking this DProf was prompted by built environment students' NSS and MES evaluations of assessment feedback as being the weakest part of their learning experience. This evaluation was across the HE sector as well as in the Department. In the Department, reasons for this remained unknown and although efforts had been made to resolve the problem it persisted. Exploring this was to be the first stage of this research journey, as the researcher sought to understand causes and then to identify possible solutions to this problem.

4.3 Gather background information

In Stage One of this DProf a sample of written feedback provided to built environment students was collected and analysed. Although in many respects the feedback matched literature and so revealed nothing new, it was noted that reference to professional practice was absent. This was an interesting finding, as the courses were seeking to prepare students for industry so it might have been expected that professional practice would be prevalent in assessment feedback. These findings suggested that the professional practice dimension of assessment feedback was an area worthy of investigation. Theory was also examined to help the researcher understand the key issues in the area under investigation. For a more complete picture of the problem, it was also important to examine assessment in this research (Chapter 1, Section 1.1.3). Consequently, it was appropriate that the research should, at that point, be widened to examine how assessment can be made more authentic to professional practice and, allied with assessment feedback, enhance built environment undergraduates' learning experience. Having thus established the direction of the research, this then set the scene for the design of the study in the thesis.

4.4 Designing the study

Having clarified the problem to be addressed and established the central research question and sub-questions, it was necessary to design the study to address the questions. In order that improvements to practice could be made, action research would be appropriate. However, because it could be difficult to enhance practice without a frame of reference, it was determined that comparative case studies would provide helpful contrast with the Department and could stimulate ideas for modification to practice. These two methodological approaches were used in tandem.

The action research involved in the first cycle gathering and analysing data then in the second cycle modifying practice. This first cycle was necessary in order to have a clear view of the prevailing situation regarding assessment and feedback in the Department and the comparative courses. It would then be possible to modify practice, seeking to enhance the student experience and using the comparative courses to generate ideas for modification to practice. Throughout the study, further data would be gathered and analysed as the work progressed in order to understand the issues involved and also to inform the action research decisions made. Shortly after starting this thesis, the researcher was appointed to the post of Department Learning Lead which proved helpful as it enhanced and further legitimised within the Department a platform for this action research.

4.5 Collecting and analysing data

Data was gathered and analysed, and it must be note that to an extent this is an iterative process as the work proceeded. Table 4.2 provides a summary of the activities in the cycles of action research undertaken for this thesis and where the corresponding data information is to be found in the relevant appendix.

Table 4.2 Summary of the cycles of action research in this thesis

Step	Efron and Ravid (2013)	Action research cycle 1	Action research cycle 2
Step 1	Identify the problem.	Design the research questions (Chapter 1).	As previously.
Step 2	Gather background information.	Examine theory and literature regarding assessment and assessment feedback (Chapter 2).	Continue to examine theory and literature.
Step 3	Design the study.	Comparative case studies to inform action research activities in relation to assessment and assessment feedback (Chapter 3).	Design and undertake activities regarding modification to assessment and feedback, and also modify researcher's own module assessment (Chapter 4 and Chapter 6).
Step 4	Collect data	Gather data from course documents and initial focus group of students to establish the *status quo* (Appendices I, J, K, L, M, N).	Gather data from focus groups, documents and interviews (Appendices I, J, O, P, Q).
Step 5	Analyse and interpret data.	Thematic analysis, data reveals that assessment is not always authentic to professional practice.	Analyse and interpret data following modified practice (Chapter 6 and Chapter 7, Section 7.3).

Step 6	Implement and share findings.	Share findings in focus group / meetings and Department Development Days.	Production of the toolkit, modify course handbook, modify assessment review protocol (Chapter 9). Paper accepted for conference September 2019.

The first task was to establish the current situation regarding current practice and perceptions of assessment and assessment feedback on the courses. Consequently, it was necessary to examine course documentation to establish how professional practice was included in built environment courses and those of the comparative cases (Chapter 5). Each of these documents contributed to the assessment and assessment feedback process that students experienced. Analysis of the documents revealed that although there was reference to professional practice in the PSRB and course documentation, assessment design was not always authentic to professional practice.

It was important to gather data from students and tutors in order to establish their perceptions of the *status quo* and understand how these align with the documentation and so gain a deeper understanding of the issues involved. Data was gathered from an initial focus group of students, findings of which suggested that they were less than fully satisfied with their experience in respect of assessment and assessment feedback, which they considered sometimes lacked authenticity to professional practice.

Having investigated the *status quo,* this set the direction for the next cycle of action research, which focused on authentic assessment and allied feedback. It was necessary at the outset of this stage to discuss assessment practice with tutors in the Department. Therefore, two meetings of Department tutors were held, the first was on 14 July 2016 for surveying course tutors and the second on 18 July 2016 for architecture, construction and civil engineering tutors. These meetings concerned the delivery of new modules which were to commence in September 2016 as part of a mini update of courses. The original purpose of these meetings had been to discuss module assessment, content of module guides and the schedule of lectures. With the agreement of the Deputy Head of Department and course tutors, these meetings were modified and incorporated within this research as focus group / meetings to discuss assessment and assessment feedback.

The focus group / meetings were a valuable mechanism to explore authentic assessment. However, it became evident that many tutors perceived assessment as authentic, having no need for change. In respect of feedback, tutors' concern was that many students did not engage adequately, if at all, with their feedback. It was important at this point to reflect and take a flexible approach (McIntosh, 2010) to the action research in order to drive the work forwards. Having undertaken these focus group / meetings, it was concluded that a sensible course of action would be to further explore the comparative courses to better understand their assessment and feedback practice.

For this reason, two preliminary meetings were held on 15 August 2016, one with a senior optometry tutor and one with a senior forensic science tutor. The researcher also viewed their respective course facilities at this time.

During the meeting with the forensic science tutor insight into the work of forensic science practitioners was explained and the learning experience provided for students was discussed along with how this experience sought to prepare students for industry. Following the meeting, there was a tour of the forensic science facilities. The laboratory contained specialist analytical equipment used by forensic scientists and the crime scene room was a classroom converted and equipped to replicate a reception room in a typical UK residential property. The space in which learning takes place has some bearing on the activities of learners (Middleton, 2018), and it was apparent from these visits that the space for assessment activities contributed to the learning experience of assessment.

The preliminary meeting with the optometry tutor and subsequent tour of the eye clinic provided further insight to the course and how students were prepared as optometry professionals. The eye clinic was a fully functioning optometry clinic. Throughout their course optometry students undertook practice-based assessments in the clinic conducting eye examinations, and towards the end of their course gained “hands-on experience working with the public” (Anglia Ruskin University, 2018d). From the start of their course optometry students were expected when they were in the clinic to dress and behave as professional practitioners and were provided with written information detailing what this involved. This was different from the Department where there was no such expectation or requirement regarding dress or behaviour.

These two preliminary meetings helped to clarify and deepen the researcher’s understanding of the issues involved, and authentic assessment was re-conceptualised as being on a continuum of authenticity rather than being binary – authentic or inauthentic. This was a helpful insight for the researcher’s own modification to assessment. For theoretically-based contextual subjects such as construction economics, this continuum meant that it would be possible to design assessment which had some authenticity rather than being solely theoretically-based. In short, a degree of authenticity could be introduced into assessment in a theoretical subject on built environment courses.

It also became clear that for built environment students there could be instances where it would, at best, be very difficult to design authentic assessment including in a practice-

based module, for example in the management of a building site or the design and construction of pavements. This was in sharp contrast with the optometry course in particular, where assessment required students to undertake the day-to-day activities of practitioners. This suggested that for built environment courses, the subject under consideration influenced the potential degree for authenticity of assessment that might be realized.

It was important to maintain the profile of this action research and authentic assessment in order to encourage modification to assessment practice in the Department. Therefore, in conjunction with the Faculty Academic Development Principal Lecturer, two Department Development Days were designed and delivered. The rationale for this was, as integral to the action research, to discuss assessment and assessment feedback in relation to professional practice. The first Development Day was held on 20 December 2016 and the second on 12 May 2017. These Development Days were to contribute to the teaching and learning aspect of the Department, and to disseminate and discuss findings thus far from this research.

Throughout this cycle of action research, there were also informal verbal discussions with tutors in the Department regarding authentic assessment, and, during the marking period, tutors were encouraged to consider professional practice in their assessment feedback. These discussions had the advantages of being timely, frequent and delivered on a one-to-one basis with opportunity to explore the subject.

It must be noted that once assessment had been made available to students, the university did not permit any change to the brief or assessment criteria. Consequently, it was important great care was taken in assessment design, as it would not be possible to make any changes or perceived corrections or improvements to the brief once it had been published.

The assessment in a practice-based module was modified. Students on that module were assessed, in part, through a group presentation. Previously they had most of a semester in which to prepare their presentation; in the modified assessment they had one day. In addition, whereas the original presentation was to module tutors, the modified assessed presentation was also to include an industry practitioner who was not known to the students. Both of these intended to bring about an increased degree of real world authenticity and challenge. This could help prepare students for industry by providing an experience which would more closely replicate something of the real world to which

practitioners must respond. The tutor reported that this modified assessment did create more work than previously because it required the presence of a practitioner who had to be identified, agree to attend and be available on the appropriate day. It might also be necessary to pay their expenses. This presented an additional challenge in respect of authentic assessment; it might require more resources than otherwise, including tutors' time. However, the concern of the Department, and indeed the University, is that students will have an effective learning experience and so this should be the focus of assessment. Further, it is possible that practitioners may participate on a voluntary basis, and indeed employers do support the courses by attending and contributing to the course liaison meetings.

Assessment in the researcher's 15 credit level 4 construction economics module was also modified. This was the only undergraduate module the researcher had which contained a coursework element. It had been necessary here to reflect-in-action (Comer, 2016). The researcher perceived from experience that some students found this subject removed from their own industry. The researcher had to identify how this could be addressed without diminishing the academic base of the module, and initially, this appeared problematic. The module was theoretically-based, and initially it seemed that there might be limited scope for authenticity. Producing authentic assessment in this module was challenging; it was difficult to know what would be valuable for students to help them to acquire useful skills and knowledge, yet still achieve the goals of the module. Drawing from findings from the comparative courses, it was decided that assessment could be enhanced through the addition of authentic material (Chapter 6, Section 6.3.2). The researcher concluded that it would be beneficial to encourage students to engage with the real world as well as theory in their module assessment. To that end, it was decided to incorporate the *Financial Times* published during the time of the module delivery within assessment requirements. This real world resource had advantages of being current and freely available online to ARU students. These were important attributes for authenticity and to ensure that all students were able to easily access the resource. This also meant that the researcher would have no control over the material which would be available for students, and indeed by the mid-point of the module delivery little had been published that was relevant to part of the course, highlighting the unpredictable nature of the real world.

It was observed that each of these two modified assessment briefs had placed increased demands on students in each of Bloom's domains – cognitive, affective and psychomotor. This suggested that the modified assessment had contributed to students'

development through replicating some real world constraints and challenges, helping them to prepare more effectively for the real world. These increased demands were noted and commented on by students (Chapter 6).

Throughout this time the researcher continued to conduct focus groups of students from across the Department and further interviews with tutors from the Department, and the comparative courses continued to be held and data analysed. These provided further valuable data regarding perceptions of assessment and feedback. The comparative courses were helpful as they provided a clear contrast with the Department and gave insight to assessment for learning, and learning about professional practice, rather than simply assessment for testing. They provided insight to the role of feedback, different approaches to constructing feedback, and ways that students perceived and engaged with feedback.

It could be useful to understand what influences existed on assessment in courses which were not accredited as such a comparison could help elucidate the influence of the PSRB requirements. In contrast with the courses under study, the philosophy course was not accredited. Consequently, the senior tutor on this course was interviewed. It emerged in this interview that a key influence was the same as one in the Department; focus on development of students' employability skills. Additionally, philosophy tutors examined what other similar philosophy courses at other HEIs offered to ensure that their course remained competitive, although this was not strong a driver of course design in the Department. Exploring non-accredited courses proved useful in further understanding the importance of degree courses providing students with skills to equip them for employment in industry, even if the course is not clearly linked to a particular industry.

The issue of assessment feedback was also addressed. It was found that feedback often concerned issues arising from the brief. Therefore, the researcher decided to find out more about the role of assessment design on the construct of feedback. Assessment feedback on the dissertation module was investigated, as this module was similar in a number of the courses under investigation. Feedback was gathered from built environment, optometry and forensic science dissertation modules (Chapter 7, Section 7.4). Investigating this would provide insight to feedback provided on disparate courses using the one module on each course which had comparable assessment. Findings here revealed that in these modules, the feedback was similar across all of the courses, suggesting the important role of the brief as an influence on feedback.

In view of the findings thus far it was decided to conduct additional interviews with employers in order to establish their perceptions of how the courses help students prepare for industry. It was important to understand their perspective and whether they could perceive any changes in their employees as a consequence of their studies because this could help the researcher to understand the industry point of view and what may be done to better meet their needs. In summary, employers expressed limited interest in assessment and feedback, and articulated the view that employment was where students really learned their profession rather than through their formal learning. This suggests that employers may regard formal learning as a means to acquire a qualification rather than for learning. It may also suggest that formal learning was not meeting employers' needs as well as might be desired and this had become accepted as the norm.

To evaluate the findings of the research there were follow-up focus groups of students in the final cycle, after students had completed the modified assessment and subsequently received their feedback and mark. Additionally, there were interviews with tutors and with employers. These were to verify or refute the findings of this research following the modifications to practice.

4.6 Implement and share findings

The final stage of this research was to implement and share the findings. The toolkit (Chapter 9) is used to help inform the design of assessment and links with the internal assessment review process. The FdSc Surveying handbook has been modified to provide generic information for students regarding use of feedback. In the Department, assessment protocol is modified to enhance the degree of authenticity in assessment design in the surveying area. [Researcher's note: towards the end of completing this thesis, the university was re-structured and as part of this re-structure the Department was sub-divided into three areas each of which may determine its own internal assessment moderation protocol. The researcher is based in the surveying area and continues in her role as Learning Lead. At the time of writing, the appointment of a Learning Lead to each of the remaining two areas had not been made and so it cannot be stated with confidence that the new appointees will use the same review protocol as that used in surveying, although it is intended that the researcher will explore this at the appropriate time with the new appointees]. A conference paper has been accepted for September 2019, and this paper explains the modified assessment in the practice-based

module in this action research and how it was perceived positively by students as an effective learning experience.

4.7 Conclusions of this chapter

The combination of comparative case studies with action research provided insight to other ways of considering authentic assessment and allied feedback. It was clear that the use of the comparative cases had stimulated ideas around authenticity that might not otherwise have emerged. Consequently, the research was enhanced through this insight, which helped the researcher to understand how authentic assessment may be designed and the re-definition of what may be deemed authentic – a continuum of authenticity.

Using action research was also valuable because it stimulated a reflective approach which was beneficial, allowing the research to modify her own practice and profit from that experience, and also developing an understanding of the challenges of creating authentic assessment with allied feedback. The action research also allowed the activities undertaken to be flexible, responding to events as they arose. This was particularly helpful as the research progressed as it meant that new avenues of interest which emerged were explored and these might otherwise have remained closed.

Chapter 5 Presentation of Findings Regarding Research Sub-Question One

5.1 Introduction and overview of this chapter

5.1.1 Purpose of this chapter

Following the introduction, chapters two and three of this thesis were literature based and examined theoretical issues. Chapter four provided the reader with the underpinning philosophical paradigm for this research as well as the methodological approach and methods for data gathering and data analysis. This fifth chapter is the first of four data-based chapters. The purpose of this chapter is to present findings in relation to the first research sub-question, which is as follows:

How is professional practice included in courses?

The rationale for this sub-question is to understand in what way professional practice is embedded within the design and delivery of courses under examination. This is the only data-based chapter which does not contain action research as this chapter seeks to establish the position in respect of the issues under investigation at the outset of this research. As noted in Chapter 3, data was collected from the Department and also comparative case studies from forensic science and optometry courses. Professional practice could be considered a key driver of curriculum design for practice-based courses (Cotgrave and Kokkarinen, 2010). Clarifying how professional practice is embedded within courses is important in this study because courses in the Department are practice-based and prepare students for industry.

5.1.2 Outline of this chapter

This chapter is divided into four parts, the first three of which are sub-divided. This introduction is the first part. The second part presents the findings of this chapter in respect of key documents that inform the student experience. These documents are the PSRB accreditation documents, Course Specification Forms (CSFs) and module guides which include assessment briefs. The reason for presenting the documents in this order is because this is the sequence of activities, from course accreditation followed by course design then module design and finally assessment. There is then a discussion of these findings followed by a response to the sub-question. The final part of this chapter is a short summary of this chapter.

5.2 Findings of this chapter

5.2.1 Themes from PSRB generic accreditation documents

PSRB documents provide information for HEIs regarding what they must demonstrate in order for their course(s) to be accredited. These documents are analysed as they inform course design and meeting their requirements is necessary to secure accreditation of courses, which in turn has implications for student recruitment. The construction foundation degree, although not accredited, was similar to the construction management and surveying honours degree courses because it was designed to facilitate transfer to those courses.

There were differences between PSRB documents regarding the extent to which they detailed course content and the assessment activities to be successfully undertaken by students; this was reflected in the word count of the accreditation documents (Table 5.1). GOC documentation was longer than that of any other PSRB in this study. The GOC was more prescriptive than any other PSRB in this study, including detailing those assessment activities or competencies that students were required to complete successfully. For example, the GOC prescribed the number of safe patient episodes of specific activities with particular categories of patient that each student was to achieve. No other PSRB specified in such detail an assessment activity that was to be successfully completed by each student. By contrast, built environment PSRBs afforded course tutors a degree of flexibility. The CSFS was the most easy-going of any PSRB, and their accreditation documentation was noticeably shorter than those of any other PSRB in this work.

Table 5.1 Word count of PSRB accreditation documents

PSRB	Word count
Built environment PSRBs	
ARB	1762
CIAT	1703
CIOB	1858
JBM	1572
RICS	2151
Comparative PSRBs	
CSFS	360
GOC	7337

Emerging ideas were refined and then grouped into themes. An example of data from each theme is provided in Table 5.2.

Table 5.2 Themes contained in PSRB documents

Themes	Examples of themes from the data
Knowledge and understanding	Knowledge of cultural social history and theory
Application of knowledge	Application of health and safety
Thinking and judging	Conception of plausible solutions
Communication	Encourage clear communication through sketching and drawing
Team working	Demonstrate team working skills
Professionalism	Client care

As may be expected, these themes were elucidated in a variety of ways, each appropriate to the particular PSRB and roles a practitioner in that field could reasonably be expected to undertake.

5.2.1.1 Knowledge and understanding

Unsurprisingly, analysis of the documents revealed that each of the PSRBs required students to acquire technical Mode 1 knowledge which was deemed necessary to function as an effective practitioner in the relevant industry. The following examples illustrate this point.

> *Demonstrates an understanding of the principles of different types of management including refractive* [GOC].
>
> *Understand and describe the potential complexity of crime scene investigation, practical and legal constraints, need for timeliness* [CSFS].

Built environment PSRBs also required technical knowledge and understanding.

> *Understand the management of construction processes as they relate to: • the project from inception to recycling • understanding corporate organisations, industry, clients and society* [CIOB].
>
> *Understand how the construction method, issues of safety and legislation, and the concepts of buildability can drive design* [JBM].

> *Demonstrate knowledge and understanding of the techniques for conflict avoidance, conflict management and dispute resolution procedures including for example adjudication and arbitration, appropriate to your APC pathway* [RICS].

Interestingly, these excerpts do not require that students demonstrate practitioner competence in these areas, only knowledge and understanding of the subject. These are lower-level cognitive attributes (Bloom, 1956) and necessary for practitioners. However, practitioners need to be able to apply their knowledge and develop their higher-level cognitive skills in order to be fully effective.

5.2.1.2 Application of knowledge

Application of knowledge was required by each of the PSRBs in this study. This is illustrated in the following excerpts.

> *The application of appropriate theoretical concepts to studio design projects, demonstrating a reflective and critical approach* [ARB].
>
> *Develop and apply policies to eliminate waste within the lifecycle of a construction project* [CIOB].
>
> *Provide evidence of practical application of health and safety issues and the requirements for compliance in your area of practice* [RICS].
>
> *Describe and demonstrate adherence to safe working procedures* [CSFS].

Students' application of practice-based knowledge is important for their development as practitioners, and it is incumbent on tutors to support students' to develop these attributes. These PSRB requirements were intended to ensure that students were able to apply their knowledge in a professional capacity, developing industry skills.

The GOC had a prescribed list of knowledge and skills that graduates were required to evidence through successfully completing a specified number of assessment activities, and also stipulated that

> *'Ability to do' competencies must be tested through practical assessment* [GOC].

This is in sharp contrast with built environment PSRBs, which afforded tutors considerable autonomy in respect of how practice-based knowledge was to be demonstrated by students. This autonomy was integral to the accreditation process in that institutions demonstrated their proposed assessment in the documentation provided but there was no expectation that particular activities would be undertaken.

5.2.1.3 Thinking and judging

Higher-level thinking and judging skills were manifest in a variety of ways in the PSRB documents.

> *Develop a conceptual and critical approach to architectural design that integrates and satisfies the aesthetic aspects of a building and the technical requirements of its construction and the needs of the user* [ARB].
>
> *Ability to problem solve to realise the design into built form through the generation of detailed design solutions* [CIAT].
>
> *Evaluate and apply different performance management techniques to complex projects* [CIOB].
>
> *An ability to 'think outside the box'. Could a better design be achieved if unnecessary constraints (explicit or implicit) in the brief were renegotiated?* [JBM].
>
> *Provide evidence of reasoned advice given to clients and others of the principles and tools of business planning and be able to evaluate your performance and outcomes* [RICS].
>
> *Evaluates and manages patients presenting with symptoms of retinal detachment □ Identifies, evaluates and investigates significant symptoms □ Assesses risk factors* [GOC].

Each PSRB expected that graduates would be required to solve practice-based professional problems. These were practical activities through which students would demonstrate their learning and higher-level cognitive thinking in a professionally relevant context.

5.2.1.4 Employability

Employability skills commonly focused on communication and teamwork. The nature of communication requirements varied between the PSRBs and were directed towards developing students as effective practitioners within their particular field of activity. The following examples illustrate this.

> A*bility to apply a range of communication methods and media to present design proposals clearly and effectively* [ARB].
>
> *Presentation of Architectural Technology information and clear articulation of arguments to a range of audiences* [CIAT].
>
> *An ability to interact with clients to help both client and other team members develop a better understanding and definition of the brief and the functional, social and economic objectives* [JBM].

Demonstrate knowledge and understanding of the techniques for conflict avoidance, conflict management and dispute resolution procedures including for example adjudication and arbitration, appropriate to your APC pathway [RICS].

Communicates with patients who have poor or non-verbal communication skills, or those who are confused, reticent or who might mislead □ Makes effective use of body language to support explanation □ Demonstrates awareness of our own body language □ [GOC].

The GOC provided most detail regarding communication and how it should be manifest. Communication was explicit in each PSRB with the exception of the CIOB, although there it was obliquely identified. For example, the following extract has a presumption that the student communicates effectively in order to be able to apply the principles.

Demonstrate a professional attitude to health, safety and welfare and apply these principles to project [CIOB].

As these excerpts show, communication was positioned by each PSRB to meet likely demands made of practitioners. As well as applying principles of communication these also required application of higher order cognitive thinking and affective skills. In other words, the PSRB demanded integration of knowledge and skills in order to function as a practitioner. This focus on communication for professional practice is important because specific practitioner roles require particular communication skills. It is worth noting the findings of Moore and Morton (2017) that writing in the workplace is different from academic writing; students should develop each of these skills in their studies. This suggests that undertaking real world activities is important in order that students may develop effective skills. This does not suggest that academic standards should be ignored, but rather that additionally students should be helped to develop appropriate employability skills.

Teamwork skills were a requirement of each PSRB, highlighting the significance of teams in the workplace. The following extracts illustrate this point.

The role of the architect in the design team and construction industry [ARB].

Ability to work independently and as a member of a team [CIAT].

Demonstrate respect for fellow team members and their role within the construction industry [CIOB].

In practice design is almost always a team activity and as such students should work in groups for a substantial part of their design learning [JBM].

Provide evidence of practical application of working as a team member in your area of practice [RICS].

Demonstrate effective working as part of an investigative team [CSFS]

Is able to work within a multi-disciplinary team Respects the roles of other members of the practice team and how working together gives the patient the highest possible level of care [GOC].

The GOC specified the need for multi-disciplinary teams, and as Wood (1999) found, creating multi-disciplinary teams presents challenges. In the built environment, as in other industries, multi-disciplinary teams are composed of a diverse range of professionals, each with their own perspective of a project. If assessment does not incorporate such multi-disciplinary teams then students may not have a real-world experience, limiting their opportunities for learning. In assessment teams were often composed of students on the same course, yet multi-disciplinary teams would offer students a more authentic learning experience because this is a more accurate reflection of the real world. Not detailing such challenges in PSRB documents could be considered a weakness as multidisciplinary teams are often used in the built environment. Creating multi-disciplinary teams of students for assessment in the Department is not without its challenges (Pooley and Wanigarathna, 2016). For built environment students, such real world assessment activities should be part of their preparation for professional practice.

5.2.1.5 Professionalism

The theme of professionalism contained an assumption that professional or professionalism was known and understood, and could be achieved within the strictures of an undergraduate degree. As this thesis has shown in Chapter 2, there is no widely agreed definition of professional. PSRBs in this study made reference to professionalism either through their Code or Rules of Conduct or Practice, or by use of the word professional.

The GOC accreditation documents emphasised that professionalism should be integrated throughout the course and was linked with development of higher level cognitive skills. The CIOB and RICS accreditation documentation made reference to their respective Code or Rules of Conduct.

Professionalism and communication skills must be integrated throughout the programme The route to registration should enable the student to develop the ability to exercise professional judgment through critical thinking, evidenced based practice and reflection [GOC].

> *Demonstrate awareness of the Code of Conduct. Apply the Code of Conduct to own practice* [CIOB].
>
> *An appreciation of your personal and professional role and society's expectations of professional practice and RICS Rules of Conduct and conduct regulations, including the general principles of law and the legal system* [RICS].

By contrast, ARB, CIAT and JBM accreditation documentation identified professionalism but did not make reference to their Code of Conduct.

> *The nature of professionalism and the duties and responsibilities of architects to clients, building users, constructors, co-professionals and the wider society* [ARB].
>
> *As a subject that bridges theoretical, practical and professional activities its pedagogy embraces the practical application of theory and the embedding of employability skills* [CIAT].
>
> *Stimulate and encourage student interest and appreciation of engineering as an intellectual and professional activity* [JBM].

These suggest that although professionalism remains difficult to define nevertheless PSRBs require students to develop their knowledge and skills in this area. Built environment practitioners may find their PSRB Code of Practice helpful to guide them (Poon and Hoxley, 2010), yet only two of the PSRBs accreditation documents specifically directed students and tutors to these. These PSRBs each seek to prepare students for professional practice and although professionalism is embedded within accreditation documentation, it is not always clearly defined. This is similar to findings of Morihara, Jackson and Chun (2013), that there is no standardised definition of professionalism for the undergraduate curriculum. Although their work related to undergraduate medical courses, it nevertheless highlights an important issue. Clarification of this abstract concept would help tutors to support students' development of appropriate professional attributes.

5.2.2 Themes from Course Specification Forms (CSFs)

Themes from the CSFs are provided in Table 5.3.

Table 5.3 Themes contained in CSFs

Themes	Examples of themes from the data
Knowledge and understanding	Assimilate, memorise and recall knowledge related to the built environment
Employability	Demonstrate a capacity to work in a team
Problem solving	Develop problem solving
Professional	Apply professional judgement
Practice-based activities	Practical skills are further developed through Work Based Learning

Curricula in the Department is designed to develop students' knowledge as they progress through their course, and cumulative learning (Maton, 2009) is the goal. For example, the module Quantity Surveying Practice 1 at level five is followed by the module Quantity Surveying Practice 2 at level six. However, the CSFs did not require authentic assessment activities, meaning that inauthentic assessment could still meet course requirements.

> *A student active approach to the acquisition of these skills is used* [architectural technology course].
>
> *Practical skills are developed through project and practical sessions and site visits* [construction management course].

As may be seen, it would be possible to create assessment which was not entirely authentic but yet met these requirements. These excerpts illustrate that CSFs leave open the potential for inauthentic assessment, which would potentially limit students' opportunity to prepare for industry.

5.2.2.1 Knowledge and understanding

Just as PSRBs required knowledge and understanding so too did the CSFs, as the following examples illustrate.

> *To provide a knowledge of the fundamental scientific, technological and organisational principles underpinning architectural technology* [architectural technology].

Demonstrate a knowledge of the fundamental facts, concepts and principles related to domestic, industrial, commercial and sustainable construction [construction].

Uses appropriate methods of examination to enable differential diagnosis [optometry].

Each CSF required students to acquire both Mode 1 and Mode 2 knowledge which was relevant for industry, and which would develop students as practitioners. As can be seen from the above extracts, these provide direction regarding what should be included. However, demonstrating knowledge is not the same as being able to do something effectively. This must be regarded as problematic. If students are not able to undertake activities of a practitioner then their opportunity to learn how to become a practitioner is diminished because they are acquiring knowledge but not gaining experience.

5.2.2.2 Employability

In optometry courses, employability skills were presented as, for example,

interpersonal skills are embedded within the course [optometry].

Employability was manifest in different ways, for example teamwork and communication were often specified and are attributes required of practitioners in industry.

Work as part of a team contributing to defining goals and group dynamics [quantity surveying].

Demonstrate a capacity to work in a team [BSc Civil Engineering].

Communicate effectively in spoken, written and graphical forms so as to present complex concepts to clients [architectural technology].

In each course, there was a clearly stated goal of developing students' employability skills appropriate for the relevant industry. It is worth noting that other employability skills were less frequently mentioned, and positive attitude, which is at the centre of employability skills (Chapter 1, Figure 1.1), not at all. This suggests that there is scope to enhance this part of course provision.

5.2.2.3 Problem solving

Each course in this study expected students to demonstrate their problem solving skills.

Demonstrate a competence in problem solving [quantity surveying].

Ability to conceptualise, investigate and develop design solutions [architecture].

Demonstrate and use problem solving skills [forensic science].

Identifies and explains any problems which may occur from the given prescription and offers solutions, for example, aniseikonia, anisometropia [optometry].

Detail regarding how problem solving skills were to be developed was at tutors' discretion in built environment courses, whereas in optometry there were guidelines as to the type of problem which may be encountered. Problem solving is an employability skill, although was not always set in the context of professional activities in the CSFs. Undertaking real world activities can support students' development as industry practitioners. As such, it is arguably a weakness that these documents do not provide more clarification regarding the real world nature of such problem solving. This would give students the opportunity to address the type of problem encountered by practitioners and challenge them to develop their real world skills.

5.2.2.4 Professional

Professional was included in all of the CFSs, except for forensic science, which made no explicit reference to professionalism.

An understanding of the professional relationship of architect within Built Environment and the construction industry [architecture].

The aims of the award reflect the professional and expanding role of building surveyors [building surveying].

As has already been noted (Chapter 2, Section 2.5), there is no widely agreed definition as to what being a professional means or incorporates, yet developing students as professional practitioners on accredited courses requires that students develop an appreciation of what becoming a professional entails. It is appropriate that professionalism is included in courses but clarification of what is involved would help students appreciate attributes required in industry.

5.2.2.5 Practice-based activities

It was clear in the CSFs that there was intention to develop students' knowledge and skills as practitioners in the relevant profession, to develop their ability to undertake activities that would be necessary in practice. The CSFs made reference to practice-based activities or skills.

Production of architectural designs [Architecture].

Develop practical engineering skills [BSc Civil Engineering].

Determine current and accurate valuations [Real Estate Management].

However, as may be seen in the above examples, these could have been achieved through a diversity of means and the extent to which they expected replication of the real world was open to interpretation.

5.2.3 Themes from module guides

Each module had a module guide produced by the module leader and updated annually as required. At the commencement of each module delivery, the guide was provided to all students studying the module. It was a requirement for these guides to be produced on the ARU template and this was modified by each Faculty director of learning, teaching and assessment as they deemed appropriate for use throughout their Faculty (Appendix B). For each module, tutors added relevant information to the template regarding individual module content, ILOs, an outline of weekly topics, reading to be undertaken, information regarding the mode of assessment, and in the case of coursework the assessment brief and assessment criteria. Additionally, the template contained standardised administrative information regarding university resources, regulations and protocols. However, that material falls outside the scope of this work and consequently was excluded from this study.

A random sample of module guides from each course and level of undergraduate study in the Department was obtained (Chapter 3, Section 3.5.1.1). Only subject specific content of these guides was included in this research, the generic template material was excluded. The module content was analysed thematically (Chapter 3) and themes are provided in Table 5.4.

Table 5.4 Themes contained in module guides

Themes	Examples of themes from the data
Professional knowledge and skills	Prepare a detailed valuation report with full calculations that provides the client with appropriate advice
Thinking skills	Interpret drawn and written information.
Communication	Learn to write a concise report.

5.2.3.1 Professional knowledge and skills

Attributes developed in built environment courses were in sharp contrast with the assessment of practice-based skills in optometry, where students frequently operated as practitioners in order to complete assessment activities. Effectively optometry students were practitioners-in-waiting, undertaking work of practitioners and developing knowledge and skills of a practitioner in that role. Although they were novice to the assessment tasks, nevertheless they were required to undertake those tasks and were able to develop as practitioners through simulated conditions which progressively increased through the course; a Vygotskyan approach to learning. Optometry assessment which was theoretically focused made no pretence to be authentic. Where authenticity was possible students undertook real world activities; where it was not possible, for example securing patients with ocular conditions, then by necessity other devices were used for assessment.

> *Assessment of practical skills to include focimetry and hand neutralisation … a five station OSCE: slit lamp techniques, Subjective refraction, Retinoscopy, Binocular Vision, Indirect Opthhalmoscopy* [optometry]. [Researcher's note: OSCE is acronym for Objective Structured Clinical Examination].
>
> *Assessment comprises a test of 20 slides depicting different ocular conditions* [optometry].
>
> *Reflective essay about the skills (practical and academic) you have acquired over the past year* [optometry].

All built environment module guides examined for this research, a total of 28, contained themes relating to knowledge and skills that students were to develop. Of these module guides, eight contained assessment which required some form of engagement with the real world, and of these four had a requirement to undertake an activity that could be expected of a practitioner in the relevant profession. The remaining guides contained assessment that required description of the real world or were theoretically focused rather than being practice-based. These guides tended to focus on Mode 1 knowledge in assessment and this was often at the expense of engaging with the real world. The following excerpts illustrate these points.

> *Determine a hypothetical proposal* [architecture].
>
> *Role play* [surveying].

This suggests that the learning experience for students sometimes was seeking to develop students' knowledge about professional practice but did not require students to undertake professional practice based activities. This is an important distinction.

Understanding what happens in professional practice is not the same as being able to undertake those activities effectively. Assessment activities also lost authenticity through the inclusion of elements that were inauthentic. For example, use of '*role play*' suggested to students that the assessment was synthetic.

The knowledge to be acquired was, in each of the courses, a driving factor in the design of assessment. Potentially, at least part of the cause of inauthentic built environment assessment resided with the difficulty of creating authentic assessment in a classroom setting. However, some of these assessments could have been more authentic by removing words or phrases that suggested their work was inauthentic, or by exposing students to real world challenges or use of real world resources.

All module guides contained assessment criteria. However, no built environment criteria identified a professional practice dimension of assessment. Assessment criteria offered marks for such things as

> *format and referencing* [construction course]
>
> *presentation* [construction course].

Further, there was no explanation that effective presentation was a form of communication and an employability skill which was valued by employers. As students tend to focus their energies on assessment (Biggs and Tang, 2011), this omission from assessment criteria represents a considerable missed opportunity to help students to understand the value of skills they were to develop for industry.

5.2.3.2 Thinking skills

Developing students thinking skills was specified in all courses in this study. However, built environment students' thinking skills were not always developed through real world activities; students were often required to write about professional practice rather than actually undertake activities *of* professional practice.

> *Use a mixture of both contemporary and traditional research methods to investigate an aspect of sustainable construction or of the built environment generally* [surveying].
>
> *Produce a report analysing how your chosen organisation manages its resources and operates within the construction industry* [construction].

These activities developed students' thinking skills and knowledge of professional practice. The application of thinking skills was partially obscured from students in the absence of professional practice activity. Killen (2012) found that authenticity of assessment contributed to development of students' higher level thinking skills. This

suggests limiting these learning experiences denies students' the opportunity to develop their practice-based knowledge and skills as well as their higher level thinking skills. This was in sharp contrast with optometry courses in particular, where assessment involved undertaking real world activities in OSCEs, applying theory in practical work, and there being a clear path to progressively develop students' practice-based thinking skills in a real world activity.

5.2.3.3 Employability skills

Built environment students were guided to acquire employability skills, in particular communication and teamwork. However, students had limited opportunity to develop these skills through authentic activities containing complexities and challenges of the real world.

Four built environment modules assessed students through teamwork. The most authentic of these assessments required students to give a

> *Presentation to a potential investor for a start-up company* [construction course].

This, although potentially authentic, could be considered an unlikely activity for many construction graduates as most seek employment rather than starting their own company, and most part-time students were already in employment. Elsaiahs and Jansson (2016) found that a hands-on experience dealing with problems similar to those in the real world enhanced student performance and confidence, and not providing this could be a missed opportunity. Although students had to undertake a real world activity of giving a presentation the context could have been enhanced to further support their learning.

No built environment module guide explained which employability skills it was intended students would develop in that module. Students were provided with a handbook at the commencement of their course. This handbook did not explain what employability skills were although it had one page from a total of 18 which outlined activities undertaken by practitioners. Not identifying these skills may be a serious omission; it does not draw to students' attention an important aspect of their development and consequently leaves them in a learning vacuum with no guidance regarding the application of those skills. It would be beneficial if students were to be provided with clear information regarding the practical value of skills they were developing, to help them appreciate the value and use of their studies in industry.

5.3 Discussion

This chapter has provided findings in relation to the first research sub-question. The following inter-related aspects emerged.

Built environment documentation had varying degrees of reference to professional practice activities. This extended from PSRB documentation to assessment. CSFs and module guides contained limited reference to professional practice activities. Built environment assessment was often about professional practice rather than containing authentic practice-based activities or engagement with the real world. Raymond, et al. (2013) found when investigating authentic assessment in midwifery courses, assessment which simulates the work of a professional can help students develop confidence as well as acquire practice-based knowledge and skills. Authentic assessment could support students' development and preparation as industry practitioners. Authentic assessment can also encourage students to take a deep approach to their learning Adapa (2015).

Knowledge and skills required by the PSRBs drew from each of Bloom's taxonomy of educational objectives and included Mode 1 and Mode 2 knowledge. Cognitive skills were required and affective skills most often developed were communication and team working. Psychomotor skills were the least frequently specified skills. However, links between these domains and professional practice were not always exploited in assessment. Authentic assessment may help develop knowledge and skills in each of Bloom's domains in order to develop students as effective practitioners by undertaking activities as practitioners would. Therefore, enhancing this in assessment could help students' learning through undertaking real world activities or engaging with the real world.

Students in the Department have difficulty fully relating Mode 1 knowledge with tacit Mode 2 knowledge of professional practice (Crabtree, 2014). There may be scope to through authentic assessment to help students make this connection. Making links between Mode 1 and Mode 2 knowledge helps students to understand the application of their studies and so give them meaning. Conversely, a gap between assessment activities and professional practice possibly creates unnecessary additional challenges for students, and leaves them to make their own connections between theory and practice.

Employability skills and their value were not made explicit in the module guides nor how students were to develop them through their assessment activities. It has already been found that students in the Department had limited knowledge of employability skills (Vohmann and Frame, 2016). This is all the more surprising as built environment courses include professional practice attributes in their aims. For example, surveying courses seek to engender “understanding of requirements of professional practice and to ensure the students develop a clear sense of professional identity” (Department of Engineering and the Built Environment, 2015, p.13). Findings from the documentation examined in this chapter suggest that this goal could be enhanced through use of authentic assessment which would support students by adding synergy to their learning experience.

Professionalism in PSRB documents was achieved through reference to Code or Rules of Conduct or Practice, or use of the word professional. However, professionalism became diluted in assessment and was contained explicitly only in architecture assessment. No other built environment assessment contained such a requirement. For most built environment students, their professionalism was not explicitly developed throughout their course. Therefore, this highlights an opportunity to revise assessment in order to help develop students’ knowledge and mind-set appropriate to that of a professional practitioner.

The influence of assessment criteria on learning activities was under-used as a device to direct the learning activities of students and thereby enhance their learning experience. Although the criteria were a small proportion of module guides content, nevertheless they are important for students because they influence the students’ assessment and learning activities. However, assessment criteria tended to focus on academic matters such as referencing and often had limited reference to practice-based activities. Again, this offers a route to enhance students’ learning by including practice-base activity in assessment criteria would help direct students to undertake valuable practice-based activity.

As students assessment influences students’ learning energies (Carless, 2007), then creating authentic assessment may offer scope to enhance students’ learning as they undertake real world activities. It could be argued that design of authentic assessment requires students to use higher level cognitive skills which can replicate industry challenges in order to develop their confidence. Key to this is assessment design requiring students to actively engage with the real world. Assessment that is

inauthentic to professional practice could misdirect students. This misdirection is compounded as students are not provided with information to help them understand the relevance of skills the assessment intended they develop. Thus, students' learning experience is removed from the professional practice-based world, remaining more theoretical and having the practice-based dimension not being explicit.

5.4 Response to sub-question one

The goal of this chapter was to analyse documents that are central to design and delivery of those courses under investigation, and thereby address the first research sub-question, which is as follows.

How is professional practice included in courses?

The central finding of this chapter is that professional practice is clearly included in built environment course documentation and this originated in PSRB documents. The courses were designed with professional practice at their heart, seeking to prepare students as practitioners and this was reflected in PSRB requirements, course design, ILOs and module guides. Unfortunately, evidence collected through the data gathering process showed that although the assessment focused on the real world, it did not always require students to undertake authentic activities or engage with the real world, instead requiring students to describe or investigate rather than undertake work of a practitioner. It could be considered unhelpful if assessment is for a description of professional practice activities rather than requiring students to undertake such activities when there is the possibility to do so or to engage with the real world. There existed a gap between the activities of professionals and some assessment activities. Consequently, this was a missed opportunity to enhance students' development as industry practitioners.

5.5 Summary of this chapter

This chapter has evaluated key documents that inform the student learning experience in the Department. The central message of this chapter is that professional practice activities are clearly contained in built environment course documentation. However, assessment tended to focus on theoretical Mode 1 knowledge rather than integrating theory with practice-based Mode 2 knowledge. There is scope to develop this aspect of

course provision and so may potentially enhance the learning experience, helping students to link theory with practice and so meeting PSRB requirements while also preparing them for industry.

Chapter 6 Presentation and Discussion of Findings Regarding Research Sub-Question Two

6.1 Introduction to this chapter

6.1.1 Purpose of this chapter

The previous chapter identified means by which professional practice is incorporated into courses in the Department and the comparative courses at the start of this research. The purpose of this data-based sixth chapter is to address the second research sub-question, which is as follows.

How can professional practice be made explicit in assessment?

The comparative case studies used in this research were valuable in providing a contrast with the Department and generated practical ideas for action research of this chapter by highlighting attributes which contributed to authenticity of assessment. The comparators fed into the action research although were not part of it. The action research allowed changes to practice to be implemented and evaluated within the Department, and details of these are contained within this chapter. Themes from the data are illustrated with excerpts from the focus groups and interviews which were held before and following modifications to practice were made.

6.1.2 Outline of this chapter

Following this introduction, there is a section which evaluates perceptions of assessment design at the start of this study so that modifications to practice can be observed and compared with this initial position. The next section details the actions taken to modify practice and is followed by consequences of the actions taken. In the next section are findings from these modifications, after which is a discussion of these findings. The chapter then provides a response to the second research sub-question and finally there are conclusions of this chapter.

6.2 Students' perceptions of assessment design at the start of this study

Optometry and forensic science students held a clear perception that their assessment replicated the work of practitioners.

> *The practical's are more like what we're gonna do in everyday life* [optometry student, focus group N].
>
> *Obviously, we're testing on real patients, anyone that's just walking in* [optometry student, focus group O].
>
> *We do practical work on the scene of crime* [forensic science student, focus group Q].

No optometry student expressed a perception of their assessment as being inauthentic. All of the students in these groups perceived their assessment as being based on the real world and replicating professional practice activities. Optometry OSCEs are designed to provide standardised evaluation of clinical performance (Barry, Bradshaw and Noonan, 2013), but OSCEs also provide students with simulation of the real world. This simulation which was perceived as helpful for learning, assessment of an activity undertaken in industry by practitioners which these students valued. The forensic science students also valued real world activities.

This was in sharp contrast to students in the Department, who at the start of this study perceived there was often a gap between their assessment and professional practice activities.

> *Where here it's almost fantasy projects* [built environment student, focus group D].
>
> *So we haven't encountered much on the degree yet that have been applicable to what we do. I think we will later on* [built environment student 2, focus group C].
>
> *Purely because the modules we're studying aren't related at all to what we do outside* [built environment student 1, focus group C].

This could have been because these students were studying at level four which was composed of contextual modules in order to provide a foundation of background knowledge. However, students' at the mid-point of their course held a similar view.

> *I feel like what I do here and what I do at work, for some reason it's just different, on a respect that you're actually physically doing it as opposed to writing and finding out about it* [built environment student, focus group F].

These excerpts highlight that students' in the Department perceived a gap between what assessment required of them and what professional practice activities required. Although it could be considered appropriate that students on the course are engaged in 'finding out' about practice-based activities, arguably it is additionally valuable to undertake such activities, or simulations of them, as further learning opportunities and preparation for employment in industry.

No built environment focus group in this study perceived all assessment as being authentic and all focus groups perceived some of their assessment as being inauthentic to professional practice. Further, built environment students evaluated inauthentic assessment as a less satisfactory experience than that which was authentic. '*Fantasy projects'* and *'aren't related at all to what we do outside'* were particularly striking phrases, illustrating the extent to which students' perceived some of their assessment as being removed from the real world. This was in sharp contrast with optometry students '*testing on real patients'* and forensic science students '*practical work on the scene of crime*.' Thus, it was clear in the first cycle of this action research that built environment students' perceived some of their assessment as lacking authenticity to professional practice.

6.3 What happened next

6.3.1 Tutors' responses

The actions to produce modifications to assessment design (Chapter 4) revealed an unanticipated outcome. In the meetings with Department tutors, not all tutors perceived any need to enhance the authenticity of assessment. Some tutors' perceptions were at odds with those of students. Tutors did not perceive assessment as lacking authenticity but that assessment was authentic, as tutors sometimes wished to examine other aspects of students' learning.

> *You have to develop scenarios or projects that allow them to identify particular skills without being masked by other intrinsic factors, or other things* [built environment tutor, meeting / focus group A].

Tutors did not perceive scenarios as being a signpost for students of inauthenticity, suggesting synthetic rather than authentic assessment, and which may have contributed to student's perception of '*fantasy projects'*. Scenarios have the opportunity to be more authentic than some other forms of assessment, for example exams, yet they also have potential to under-exploit the real-world learning opportunity which could be provided for example using simulation.

Data was gathered regarding the length of each tutors practice-based experience. It emerged that each tutor in the Department had either ten or more years' industrial experience or fewer than five years, some had none being more academically focused. Those tutors who designed authentic assessment were all those with ten or more years

of experience in industry and they drew from their professional experience in their assessment design. This was also manifest in the interviews with tutors.

> *It's showing them that this is what they will do when they go out and get a job* [built environment tutor, interview BE 3].

Tutors who had fewer than five years of industrial experience perceived their assessment as either already authentic of there being no need to increase the degree of authenticity. In one instance, the tutor argued that students disliked authentic assessment.

> *I'm not convinced the* [cohort] *students value assessment that is authentic as possible* [built environment tutor, interview BE 12].

Tutors did not perceive any need for change.

> *I think most of us -- most of us try to do that anyway, to make it authentic* [built environment tutor, interview BE 9].

In a way, tutors and students concurred that assessment was inauthentic, for example containing scenarios. However, their respective interpretations of this differed. Students perceived assessment as inauthentic and so lacking relevance, whereas tutors concern resided with assessment to evaluate particular skills or knowledge.

It was clear that authenticity of assessment could be enhanced to support student learning. Key to this would be to design assessment which was authentic to professional practice while maintaining the academic integrity of that assessment.

6.3.2 Modified assessment

In the action research of this study, two modules had modified assessment. One was the researcher's construction economics module and the other was a practice-based module of another tutor. It happened by coincidence rather than design that of these modules, one was contextual and one practice-based. In view of students' perceptions of assessment, it was not entirely surprising that tutors perceived assessment as already sufficiently authentic. However, this was also an important finding - tutors' practice-based experience influenced the degree of authenticity their assessment contained. The tutor who modified their assessment had considerable practice-based experience, which gave weight to the finding that tutors with practice-based experience were more receptive to the concept and application of authentic assessment than tutors who were academically focused.

The construction economics module was delivered to all level four construction and surveying undergraduates in the Department. The assessment was composed of two elements; one 1,500 word coursework, which was modified for this action research, and one exam of an hour and a half duration. Aside from modifying the assessment brief and updating statistical data provided to students, for example providing prevailing inflation figures, no other modification was made to this module. This was a compulsory contextual module in construction and surveying courses, although not an activity *per se* that practitioners would undertake. However, the researcher considered that it should be possible to incorporate some authenticity within assessment. Therefore, assessment was designed which required students to use a contemporary authentic resource.

The brief for construction economics 2015/16 in the first cycle of action research was as follows.

> *Your brief is to produce a report which identifies and explains key aspects of the economic environment and shows why they are important for undergraduates and professionals in your discipline. The report is to be widely distributed but in particular provided to students about to start their degree and who want to know why they will study this subject.*

The brief for this module 2016/17 in the second cycle of action research with modified assessment was as follows.

> *Choose one micro-economic topic and one macro-economic topic from the module. You must then write a 1,500 word report reviewing text book literature on your chosen two topics. Also, you must find two newspaper articles from the Financial Times, one article for each topic, and published any time from 30 January 2017 onwards. You must comment on each of the newspaper articles, discussing to what extent each article is in line with or challenges the literature. You must include the articles in an appendix, including details of the author, date of publication and page number. You will find it valuable to use articles that relate to your industry or profession.*

As well as using an authentic contemporary resource, the *Financial Times,* this assessment intended to push students to become more informed about the environment in which they did or would operate as practitioners as well as help them to link theory they studied with the real world.

The assessment brief in the practice-based module in 2015/16 was as follows.

> *In conjunction with two or three colleagues you have decided to start your own construction company after you graduate. Although you have gained considerable expertise during your time at Anglia Ruskin University you have not had the opportunity to build up the capital needed to start a new company. You are therefore required to make a presentation to an investor in the hope that they will invest in your company.*
>
> *The proposed start-up venture must be connected to the construction industry. It can be a supplier, subcontractor or provide a service. The company* ***cannot*** *be a small repair and maintenance company specialising in providing a service to the elderly.*
>
> *The investor will want to know the following:*
>
> - *The business idea*
> - *How you will obtain new business*
> - *Why your company will succeed in the current market (ie what you will do differently to other companies operating in the same market)*
> - *Outline financial projections should include price point of goods or services and total value of sales.*
> - *Costs of any key materials or plant should be identified.*
>
> *During a 15 minute presentation the group will present its ideas to the investor(s). The presentation can be in PowerPoint or hard copy format. At the end of the presentation the investor(s) will ask the group questions to test the robustness of the proposal.*

In 2016/17, the brief for this module was modified to incorporate an industry practitioner in the assessed presentation, and to limit preparation time for the presentation as the brief was provided on the morning of the assessment rather than, as previously, early in the semester. These changes intended to provide students with assessment which better replicated some of the challenges of the workplace.

> *A day-long team assessment will be used to allow you to demonstrate your knowledge and understanding of the construction industry, and your entrepreneurship.*
> *On the morning of the* ***15th December 2016*** *your team will given* [sic] *a brief and four hours to prepare your team response.*

You will develop a presentation, with citations to robust sources as appropriate, of 20 minutes in length which will then be delivered to a panel including the module tutors and external guests. This presentation will be followed by a Q&A session where the panel can explore your proposals in more detail.

You therefore need to work as a team, an allocation of marks will be awarded for team coherence and cohesions, the remainder for individual performance.

The construction industry often demands quick action from its professionals, and the ability to work as a team and develop a professional response to a specific brief is often essential. This assessment provides an authentic experience of construction practice, whilst allowing your knowledge, skills and enthusiasm to shine!

Following delivery of these modules, it was necessary examine the efficacy of the modified assessment and results it produced. Each semester, ARU asks undergraduates to complete a MES in respect of each module they are studying at that time. Students who complete this survey retain their anonymity.

The MES is a paper-based questionnaire composed of 12 statements using a five-point Likert scale for responses - definitely agree, agree, neither agree nor disagree, disagree and definitely disagree, plus not applicable. This questionnaire was distributed in class towards the end of module delivery, and was only completed by those students who were present at that time. Consequently, the sample of students who undertook this questionnaire was not a random sample. The university attached significance only to the final question, which was ‘overall, I am satisfied with the quality of the module’ and required an evaluative mark from a maximum ten. ARU expected in response to this final statement that each module would achieve a minimum mean score of 6.5%. For any module with 10 or more students and a score of less than 6.5%, the lead tutor was required to produce an improvement plan for the following academic year. Additionally, there were three free-text questions in the MES asking what students liked best about the module, how the module could be improved, and, whether there was anything else the student would like to add. The MES does not ask specific questions concerning assessment. The university’s data for the number of students studying the researcher’s module, pass rates, mean assessment marks, MES scores and response rates are provided in Table 6.1.

Table 6.1 Module results and student evaluation for the researcher's construction economics module

Academic year	Number of students	Pass rate at 1st attempt	Mean mark %	Mean module evaluation, maximum score 10	Evaluation response rate %
2013/14	65	91	53	6.7	No data
2014/15	98	86	55	6.9	33
2015/16	127	88	54	7.0	27
2016/17 *	159	91	58	7.6	23

* Modified assessment

Following the introduction of authentic assessment in 2016/17, findings revealed that the module mean assessment mark and student satisfaction evaluations improved compared with previous years. This is all the more interesting given that in 2016/17 the number of students attempting the module had risen to 159. To accommodate this increase in student numbers, it had been planned to have more tutorials than in previous years. However, unanticipated problems outside the researcher's control during the module delivery resulted in only two tutorials operating rather than the scheduled four, which was a challenge. Despite this, the module evaluation score improved from between 6.7 and 7.0 in the previous years to 7.6 and the pass rate at first attempt had improved although only to what it had been in 2013/14 when the class was much smaller.

Regarding the free-text section of the MES not all students completed this section. Of those who did, in response to what students liked best about the module, 20 students wrote about the quality of teaching and only one student wrote about the assessed coursework. In response to the question regarding how the module could be improved, two students wanted more clarification of what assessment required and one wanted the brief to have an increased construction focus. Six students requested more detail regarding the end of semester examination and ten made comments which related to the cancelled tutorials. Assessment is considered central to shape students learning activities (Carless, 2007), yet the assessed assignment, which is the focus of students work, received very little comment. No student commented on the value or relevance of the assessment for their development. Further, neither the NSS nor the MES enquired

about students' perception of their assessment and its value for their development. Not establishing students' perception of the efficacy of assessment could be considered to be a weakness in the NSS and MES and as far as could be ascertained there is no device to establish whether students perceive assessment appropriate to meet their learning needs.

These improved results and student satisfaction matched findings of Adapa (2015) who found that authentic assessment enhanced student engagement and performance, and James and Casidy (2018, p.410) who found that "authentic assessments drive student satisfaction". Although the assessment had not required students to engage in a real world activity, it had required them to engage with real contemporary resources, and as in the real world it was not possible to predict what students would encounter. These findings also suggest that the modified assessment had the effect of improving students' motivation, which aligns with findings of Davison (2011, p.279) that authentic learning activities could "act as a powerful motivator to learners". Fauziah, Mardiyana and Saputro (2017) also found authentic assessment effective as a learning device. This is a particularly important point; assessment is a driver of student learning activities and authentic assessment directs students to those activities relevant for practitioners, helping them to develop relevant knowledge and skills, undertaking more effective, and potentially deeper, learning.

A second module was modified in response to this action research. Results for this module are presented in Table 6.2. It must be noted that this module was first delivered in the year 2014/15.

Table 6.2 Module results and student evaluation for a practice-based module

Academic year	Number of students	Pass rate at 1st attempt	Mean mark %	Mean module evaluation, maximum score 10	Evaluation response rate %
2014/15	45	96	65	8.6	No data
2015/16	34	100	66	7.1	No data
2016/17 *	35	100	68	8.1	77

* Modified assessment

Table 6.2 shows that the mean mark improved with the modified assessment, and although student evaluation improved compared with the previous year it was not as good as in 2014/15. This suggests that authentic assessment contributed positively to the student experience in respect of student satisfaction and achievement. One possible reason for this drop in mean module evaluation compared with 2014/15 may be that some students in the focus group reported that the assessment was stressful, and this may have impinged on their evaluation of the module. It is possible that module evaluation scores reflected enjoyment of the module, but as Kornell and Hausman (2016) observe, student evaluation does not necessarily reflect whether effective learning has taken place.

Nevertheless, these evaluations appear to indicate students' perception of the experience as positive. It is possible that there were other factors which influenced students' evaluation, but as in all anti-positive research these unknown factors cannot be entirely removed or known. The follow up focus groups of students suggested that the modified assessment in each of these two modules was perceived as an enhanced learning experience (Chapter 6, Section 6.4.1 and Section 6.4.2).

Although small samples, these findings suggest there is a positive effect of authentic assessment both for student evaluation and for achievement. Findings from these modified modules suggest that, contrary to what might be expected, it is possible to enhance authenticity in contextual as well as practice-based modules and this can give enhanced student satisfaction and improved academic results.

6.4 Findings surrounding authentic assessment

6.4.1 Real world activity and practitioners

Follow-up focus groups with students revealed that students overwhelming perception was that of an improved learning experience, more appropriate to meet their needs as undergraduates developing for professional practice. When asked whether they perceived a real world focus in assessment their response was an unequivocal

> *Yes* [built environment student 1, focus group H].
>
> *Yes* [built environment student 2, focus group H].

Regarding how the real world was manifest,

> *Well we had been put into some sort of real situation with an actual construction industry and the person from that company* [built environment student, focus group H].

It was the '*real situation'*, the use of a real company and practitioner and the consequent '*person from that company'* that contributed to authenticity. Such assessment demanded students to engage in a real-world activity, and to complete this assessment successfully required students to develop their practice-based knowledge and skills.

Using an industry practitioner proved an additional challenge for students, making it

> *a big deal* [built environment student, focus group H].

This is similar to findings of Freudenberg, Brimble and Vyvyan (2010) who found that the inclusion of practitioners in assessment impinged positively on students learning. This is important as making a presentation to a prospective client is an activity undertaken by practitioners and such assessment offers students the opportunity to experience a real world challenge. Students recognised that this assessment challenged them

> *to think very quickly* [built environment student 2, focus group H].
>
> *We had to adjust with all the members of the team. Help them out if they struggled as well* [built environment student 3, focus group H].

They experienced the heightened stresses of presenting to a practitioner rather than giving a seemingly cosy presentation to their tutors. In short, they had to undertake a real world activity under simulated conditions and experienced something of the practical challenges to be addressed. It encouraged them to function as a mutually supportive team rather than a group, and this outcome was not found elsewhere in this study. These were integrated within a single authentic assessment for the module which challenged students in each of Bloom's domains; cognitive, affective and psychomotor. It was the real situation which offered a greater degree of challenge.

6.4.2 Use of authentic resources

Real-world resources can be used to provide some authenticity to assessment, the need for which was observed by a forensic science tutor.

> *We always try and use materials from government bodies so for example there are some procedures and protocols that we, how can I say it, that are represented by the government or by certain constabulary* [forensic science tutor, interview FS 1].

It was possible to incorporate real world resources into the researchers own module. Use of the *Financial Times* as an authentic resource proved effective to enhance the learning experience. To confirm or refute this important finding regarding the efficacy of using an authentic resource, students in the follow-up focus group were asked whether it would have been better to exclude the *Financial Times* from the assessment and as previously use only text books, to which all participants replied with one voice

> *No* [all students, focus group T]
>
> *That would have been less relevant* [built environment student 3, focus group T].

It was not simply the inclusion of authentic resources that was valuable, it was students' interaction with a relevant contemporary resource that contributed positively to the assessment experience.

It is worth noting that students did not always recognise authentic resources in assessment. One tutor described how students were informed by a visiting practitioner that in fact, contrary to what they thought, demands of their assessment were indeed those required of a professional.

> *They were kind of moaning about this* [assessment to be converted to pdf format for submission] *and I was going over it, and I happened to have a guest, who had come to talk about their work, from the profession. And, you know, he just piped up, without me prompting him at all, you know, "What do you mean, we have to use that stuff all the time, this is a great skill that you're learning now, because … Whatever it has to- it goes like that. It's all PDF"* [built environment tutor, interview BE 6].

The value of having practitioners contribute to students' learning experience is illustrated by such opportune exchanges which cannot be predicted yet are valuable supports for student learning.

In the researcher's construction economics module the brief was not considered sufficiently authentic by students, although they did perceive it as better than if it had been solely theoretically based with no use of the *Financial Times*. On reflection the researcher had made assumptions which proved over-optimistic. Two students had found the assessment valuable as they had been able to hold conversation with their superiors at work regarding articles they had read in the *Financial Times*. However, the researcher had made assumptions based on her own academic position and 'territory' (Becher and Trowler, 2001). The goal of encouraging students to regard the subject as current and 'alive' had been perceived less positively than had been desired.

> *It should have actually been more construction-based articles rather than just random articles. So, at least then you're looking into your own industry. And whether or not it should've been just in the last couple of months, it maybe should've been extended a year or so to allow you to use construction kind of as an example* [built environment student, focus group T].

Possibly what the students wanted increased opportunities to easily find relevant articles, and which may have been less time-consuming to complete.

Although there had been the need to have a contemporary real world resource that was freely available electronically for the students, it was the tutor's academic territory which had been a major influence on the assessment design. The researcher had assumed that the students would become as interested as she was in real world events. Unfortunately this was realised only partially. However, the brief had been internally moderated and considered appropriate, and the external examiners were also satisfied with the brief. This suggests that there is scope to enhance the moderation process.

6.4.3 Use of real time

Real time is "the actual time during which something occurs" (Oxford University Press, 2006, p.1197). The use of real time, actual time for something to happen (Gorse, Johnstone and Pritchard, 2013), can be a challenge in built environment disciplines where timescales can be longer than the duration of a module. For optometry students time was a constraint within which they would have to operate as practitioners and this was the 20 minute duration of an eye examination.

> *In practice obviously, initially once you start work, I mean you should start with about an hour or 50 minutes per patient* [optometry student 1, focus group N].
>
> *You got to keep your time* [optometry student 2, focus group N].

In forensic science, tutors condensed some aspects of real world time in order to allow students to undertake assessment as realistically as possible.

> *Some of them now are asking for their fingerprints to be sent off for umm, fingerprint analysis which would normally take a couple of weeks. But obviously, we've shortened it out so within one week they get their results back* [forensic science tutor, interview FS 4].

In each of these courses, time was strategically used to support learning. In optometry it held a Vygotskyan dimension, as the time allowed was gradually reduced as students progressed through their course, thereby continuously developing students and challenging them to increase their efficiency. Time was designed into assessment in the practice-based module so as to reflect the real world. It was striking that only with authentic assessment did built environment students voluntarily identify time as an ingredient of their assessment experience. This was when the assessment put them under pressure of time in a way that replicated a real world activity in the modified assessment of the practice-based module.

> *We had limited time to prepare for the module, or for the assessment. Then you had to deliver the presentation* [built environment student, focus group H].

One built environment tutor recognised the relevance of using time authentically in assessment.

> *I think in the workplace, what you do tends to be time constrained. … There are very few times where in the workplace you are told, "Here's something to do and you've got six weeks in which to do it"* [built environment tutor, interview BE 8].

This recognition of time as integral to professional practice had led this tutor to incorporate time, made as authentic as possible, as a dimension of their assessment design. The tutor provided at real-time intervals during the delivery of the module a series of letters from the 'client' and missives from other practitioners. Students were to respond to these during the same short time-scale which a practitioner would have. The time constraint contributed to the assessment experience replicating an aspect of the real world challenges that face practitioners.

The importance of time in professional practice and in construction projects is well recognised (Morledge, Smith and Kashiwagi, 2006). Overrunning time creates problems (Pierce, 2013), and ensuring that projects are delivered in a timely way is integral to effective management of construction projects (Komal, Maneeth and Brijbhushan, 2015). Only in authentic assessment did built environment students and tutors identify time as relevant, recognising it as a constraint within which they would have to operate and which would impinge on their professional activities. Time as a component of assessment can give active learning direction and purpose, which enhances students' motivation (Lewis, Chen and Relan, 2017), and promotes effective learning (Prince, 2004). For built environment undergraduates, the use of real time in

assessment can improve their understanding of challenges facing practitioners and the constraint imposed by time.

6.4.4 Context – place

Optometry students attended the optometry clinic from the beginning of their course and so were inhabiting the physical place of optometry professional practice. They spoke of the clinic as a place that was integral to their learning and development as practitioners.

> *You come into the actual eye clinic, so you get the feel for how it's like working in an opticians, and you slowly start implementing it* [optometry student, focus group P].

The clinic was an authentic context and place within which to study and acquire professional practice knowledge and skills. They were to all practical effects developing as practitioners. Built environment students had no similar physical context on campus owing to the nature of their professional practice activities. The exception to this was the architectural courses which had an architectural design studio. Architectural students had

> *studio time where the lecturers come around and they will interact with us about what we're doing* [built environment student, focus group D].

However, architecture students did not focus on the context of place, but instead engagement with their tutor with the possibility of improving their work.

This use of the optometry clinic matches findings of Gulikers, Bastiaens and Kirschner (2004), that physical context is a dimension of authentic assessment. Most built environment classes were in located in classrooms or lecture theatres, and students had no opportunity for immersion in a professional context during their formal studies in a way that could be considered an experience analogous to that of the optometry students. There were multiple site and field visits, and the construction courses provided a six day residential visit to Constructionarium, which provided hands-on experience of construction in order that students could apply their knowledge of industry (Constructionarium, 2018). Arguably this identified a difficulty in the built environment student experience; that recreating an authentic physical context is sometimes a challenge for these courses, yet “learning and knowledge have a relationship with the practice or context” (Croft, 2015, p.38) and context is integral to authentic assessment (Ghosh, 2017). This represents an aspect of creating authentic assessment that is, at best, challenging to deliver on many built environment courses and was achieved only to a limited extent. It can be difficult to create real world

conditions (Ashford-Rowe, Herrington and Brown, 2014) and in the Department this was problematic because it was not possible to recreate the context of workplace in the same authentic way as it was on optometry courses. For full-time students in particular, who may have no practice-based experience, this could be a gap in their learning.

6.4.5 Context - social

Optometry students spent much time in the optometry clinic.

> *Everyone had a day of clinic, which is basically practice. We weren't assessed in that. Just to get ourselves back into well, to get us familiarized after the summer* [optometry student, focus group N].

For these students, the social context of the clinic with the requirement to dress and behave as a practitioner was embedded into their experience. They took it for granted, this was the expected way of behaving and operating. For forensic science students there was a socially constructed context integrated within their work, although sometimes the social isolation of their work was also evident, as these excerpts show

> *We do practical work on the scene of crime and we are a group when we get a lot of teamwork* [forensic science student 1, focus group Q].
>
> *In labs and stuff, you could just work alongside each other, not talk to each other each other* [forensic science student 2, focus group Q].

These suggested that the social context of practitioners' work was part of the student experience and that practice as a practitioner was an important part of the learning experience.

The modified assessment in the practice-based module required a similar undertaking by students, who were encouraged to develop a professional approach as integral to their assessment. Students were strongly advised to wear a suit or similar smart clothes although this was not part of the assessment criteria, and they incurred the tutor's displeasure when they

> *turned up in jeans* [built environment tutor, interview BE 7].

The modified assessment was providing something of the context of industry. This is a subtle yet important point – that built environment students were able in the modified assessment to more closely replicate real world activities and develop an awareness of the social requirements or expectations of industry. The students did not make reference to the dress code for assessment, although they perceived the assessment as valuable and containing a high degree of authenticity. Their focus was on the stress

of the real world activity. Possibly those students who had '*turned up in jeans*' remained silent on this issue during the follow-up focus group or did not participate.

6.4.6 Teamwork

Forensic science students identified teamwork as part of their experience.

> [In some practical work] *when we get a lot of teamwork* [forensic science student, focus group Q].

However, optometry students made no reference to teamwork, which could have been because their assessment tended to concern work as an individual practitioner conducting eye examinations. In the built environment, teamwork is an essential aspect of delivering projects, and so it would be appropriate for it to be included in assessment activities.

Modified assessment in the practice-based module contained teamwork as integral to completing the assessment. Teamwork was not a new part of the assessment, although the use of a practitioner for assessment and the real world time-constrained briefing were. In this modified assessment, built environment students identified the real-world nature of teamwork.

> *I'm a part-time student and you've got to do stuff like that. You'll get a task. You've got to work as a team* [built environment student, focus group H].

No other built environment focus group made reference to teamwork, even though it was included in all of the courses. This may have been because these students had to work as a team on a real-world project and possibly the real-world nature of the assessment contributed to this co-operative response in assessment.

Only when undertaking this authentic assessment did students perceive themselves as working in a team, sharing a common goal and responsibility for outcomes (Mullins and Christy, 2016), rather than working as a disconnected group of people. This matches findings of Lohmann, et al., (2018), that team-based learning has positive effects for students learning. However, this point is worth noting because teamwork is an important aspect of built environment practice with the need to quickly build a diversity of people into an effective team (March, 2017). Authentic assessment can provide teamwork as an effective learning experience, supporting students to develop their understanding of how teams function to achieve a common goal and practice their effectiveness in a team, rather than as a group of people but without the same mutual support.

6.4.7 Linking theory and practice

Optometry students were able to link theory and practice through their practice-based work in the clinic allied with their formal learning classes.

> *Um, I think initially it was quite hard* [optometry student 1, focus group N]
> *Yeah* [optometry student 2, focus group N]
> *We just kind of put into clinics umm, and when you've got a lot of information to analyse, umm, I think once you've practiced it enough, it just starts coming to you* [optometry student 1, focus group N]
> *Yeah, but a lot more easier* [optometry student 3, focus group N].

Optometry students had been able to link theory and practice, despite the cognitive challenges this presented, and the practice-based activities in the clinic helped them to make the theory - practice connection. In contrast, built environment students experienced difficulty linking theory and practice, linking Mode 1 and Mode 2 knowledge, which they perceived as separate entities with few links. As one student commented,

> *You've got to try and transfer that into academic skills* [built environment student, focus group H].

This was a re-formulating of their practice-based knowledge to accommodate academic requirements rather than an integration of the two. Final year built environment students also experienced difficulty making connections between theory and practice,

> *There's the real world side of it. And getting those two to relate is sometimes quite hard, because you may learn something but actually you're learning how it relates to something. It's probably a challenge, but* [tutor] *does that quite well* [built environment student, focus group I].

The students recognised the role of their tutor, who was one with considerable practice experience, in supporting them to make this connection. This comment also correlates with "*transfer that into academic skills*", and suggests built environment students did not understand theory and practice as being linked but instead as having a gap between them.

Authentic assessment in the researcher's construction economics module was effective in helping students to bridge the theory – practice gap. When asked if they had been able to link theory with the real world their responses were

> *I say yeah* [built environment student 2, focus group K].
> *Yeah, it does. Yeah, definitely* [built environment student 4, focus group K].

It must be noted that it had been a goal of this assessment was to help students understand how their theory related to the real world through use of a real world resource. Arguably if assessment is inauthentic then linking theory and practice becomes more difficult because students are trying to link three things; inauthentic assessment, authentic real world activities and theory.

6.5 Discussion of these findings

Findings of this chapter revealed that built environment students perceived some of their assessment as inauthentic to professional practice and, further, that they valued authentic assessment when provided. The action research modifications to practice, enhancing authenticity of assessment, produced improved module results and students evaluated their experience more favourably. This is an important finding because given that students focus their learning energies in particular on assessment (Sambell, McDowell, and Montgomery, 2013), “providing assessment that is authentic to professional practice is valuable as a means to develop professional knowledge and skills” (Vohmann, et al., 2017, p.240). As such, authentic assessment delivers a synergy to the learning experience, helping to link theory and practice and to develop students’ knowledge and skills for the workplace.

The real world should be clearly embedded into assessment activities, making assessment as authentic as possible, allowing students to experience something of the challenges of the real world as practitioners. Such assessment may take a diversity of forms but the object remains to ensure that students go beyond the theoretical to undertake real world activities. This is important because authentic assessment better supports students learning and development for professional practice, allowing them to experience something of the challenges of the real world. Authentic assessment can support students’ preparation for the real world (Vu and Dall’Alba, 2014). It was clear that built environment PSRBs, which are the foundation of courses in the Department, did not detail to the same extent as the GOC authentic activities which were to be included. It was also clear that some aspects of built environment work could not be recreated within a formal learning environment, for example the duration of many projects exceeds the duration of a module. Consequently, to some extent synthetic assessment is unavoidable in built environment courses. The goal is to enhance authenticity as much as possible and so help students to develop their theoretical and practice-based knowledge in readiness for their own professional practice.

It was evident that students were required to undertake some assessments which would develop their employability skills in a professional context, for example report writing. Some assessment activities were authentic to the real world and required students to undertake activities which a practitioner would carry out. However, these activities, although authentic, were sometimes diluted through the presence of words which implied inauthenticity. Inclusion of words such as '*hypothetical'* [architecture] or '*role play'* [surveying] had the effect of suggesting that the assessment was synthetic. This was in sharp contrast with optometry, where students undertook real world activities, albeit in shortened forms initially, and there was clear development of these skills as students progressed through their course.

This thesis contends that authentic assessment may offer scope to align these diverse demands, supporting development of students' academic and professional development for the benefit of students, industry and the economy. Authentic assessment could also help close the gap between theory and employers' demands (James and Casidy, 2018). Authentic assessment requires students to undertake activities they could in the real world (Litchfield and Dempsey, 2015), and engagement with this activity provides scope for students to develop their higher level conceptual skills (Raymond, et al., 2013). Real world activity encourages students to take a constructivist approach to learning and promotes deep learning (Beagon and Holmes, 2014), which may have contributed to the improved results in the modified assessment. The value of developing students' skills through real-world allows students to connect with industry in a classroom setting (Jackson, 2016). As Ruey (2010) found, taking a constructivist approach to learning, where the student is active and responsible in their own learning (Brooks and Brooks, 1999), developed students' confidence and ability to apply their learning to real world practice, which is a goal of these built environment courses.

Built environment practitioners undertake a variety of roles for a diversity of firms which demand a wide range of knowledge and skills. Some students in the Department had commented elsewhere that they did not understand the relationship between the modules they study and their course as a whole (Tree, 2014), which suggests that, despite the internal moderation process, the learning experience may have become fragmented or that inauthentic assessment has had the effect of diluting the learning experience. Effectively designed, authentic assessment can challenge students and develop their professional practice skills, thereby helping prepare them for industry.

Findings of this chapter suggest that authentic assessment offers a route to improve, if not resolve, this situation.

Designing authentic assessment offered the opportunity to integrate learning and skill development in a way that facilitated linking Mode 1 and Mode 2 knowledge. This accords with earlier research in the Department which “suggests neither full-time nor part-time students can fully relate theoretical Mode 1 knowledge at university to tacit Mode 2 knowledge in the workplace” (Crabtree, 2014, p.219). Designing assessment that was solely academic or inauthentic had the effect of reducing the opportunity to develop students understanding of the relationship between these two modes of knowledge. Integrating these helps students develop their higher level thinking skills (Litchfield and Dempsey, 2015) and authentic assessment provided a basis to achieve this.

It was found that those tutors who responded positively to authentic assessment each had ten or more years of practice-based experience, whereas tutors with limited or no industrial experience did not respond positively to authentic assessment. Each tutors own “disciplinary epistemology” (Becher and Trowler, 2001, p.23), and “personal epistemology” (Clancy, 2013, p.305) shaped their intuitive understanding regarding what constituted authentic assessment. Arguably, it is most appropriate to have tutors with a diversity of practice-based and academic experience in the Department in order to provide assessment which supports development of students’ theoretical and practice-based knowledge and skills.

Interestingly, although students perceived some assessment as inauthentic to professional practice and having limited value, they did not question the nature of the assessment or tutors right to design assessment. Tutors were providers of positivist knowledge (Mackler, 2010), they designed assessment, judged students’ work, and conferred credentials: they were central while students remained the object of attention (Leach, Neutze and Zepke, 2001). Therefore, this suggests that students accepted assessment as legitimate, irrespective of their perception of its value or of any perceived gap between assessment and professional practice. This has implications for learning, suggesting that although students may accept assessment without question, nevertheless inauthentic assessment has consequences for their achievement and their professional development.

It could be considered a weakness that neither the NSS nor the MES have any questions concerning assessment design to support learning, including preparation for professional practice. This is a noteworthy omission because assessment is central to learning and ensuring assessment meets students' learning needs in preparation for professional practice is important. Particularly in practice-based courses this is an interesting situation. It suggests that students are being prepared for professional practice with no information for course tutors regarding how well students evaluate an important part of their experience as achieving this goal. This to an extent matches the findings of Hoxley (2012), who found that building surveying students considered their course did not adequately prepare them for work in professional practice. Although the focus of Hoxley's work was curriculum design, it is nevertheless interesting to note that students held this perception of their course.

6.6 Response to sub-question two

The goal of this chapter is to analyse data from the comparative case studies and the action research in order to address sub-question two, which is as follows.

How can professional practice be made explicit in assessment?

The central findings of this chapter have identified routes by which assessment for built environment students may be made more authentic. These are:

- the use of real world authentic activities which require students to produce work and be evaluated as practitioners;
- use of real world resources;
- use of real time;
- creation of real world social context;
- teamwork; and
- use of one or more practitioners in assessment.

Providing more than one authentic feature within a single assessment strengthened the authenticity of the assessment. In other words, synergy evolved through integrating authentic devices within a single piece of assessment. Therefore, having more than one authentic feature enhances the inclusion of professional practice in assessment.

6.7 Summary and conclusions of this chapter

This chapter first provided insight into students' and tutors perception of authentic assessment at the start of this research. This was necessary in order to understand perceptions of what existed so that modifications could be evaluated against this backdrop. Next the chapter provided information regarding the actions taken to modify practice and the modifications that resulted. After this, the findings of this chapter were presented. These identified factors that contribute to authentic assessment and related issues. This was followed by a discussion of the findings and then the response to the second research sub-question.

It must be noted that some assessment in the Department was authentic to professional practice. However, some assessment was not authentic to professional practice, tending instead to focus on Mode 1 knowledge or having a degree of inauthenticity to professional practice. Professional practice was sometimes diluted in assessment which tended to focus on theoretical issues and reference to professional practice was often synthetic rather than authentic. There was a tendency in assessment to require description of rather than undertaking or engagement with professional practice.

Drawing together the threads of this chapter reveals a number of issues. Authentic assessment provided improved results and enhanced student evaluations of their experience. It is clear that authentic assessment can promote students' engagement with the real world, helping them to develop skills for professional practice, and to take a constructivist approach to their learning. Further, authentic assessment can take a diversity of forms and that more than one feature should be embedded where possible within a single assessment to synergise the positive effect of authentic assessment. Authentic assessment also offers scope to accelerate students' development as practitioners, as they engage with real world challenges and develop their knowledge and skills in each of Bloom's domains of educational objectives.

Having examined routes to make professional practice explicit in assessment the next chapter of this thesis examines assessment feedback as integral to learning in the context of professional practice.

Chapter 7 Presentation of Findings Regarding Research Sub-Question Three

7.1 Introduction

7.1.1 Purpose of this chapter

The previous chapter examined means by which professional practice can be made explicit in assessment and the role that authentic assessment plays in supporting learning for built environment students. The chapter found that on built environment courses a constructivist approach using authentic assessment encouraged deep learning and supported students' knowledge and skill development, and helped them to link their academic studies with professional practice. The purpose of this seventh chapter is to examine the feedback dimension of assessment in the context of professional practice. In particular, this chapter addresses the third research sub-question, which is as follows.

> ***How can feedback on assessment be designed and used to reinforce learning in the context of professional practice?***

To address this question, data was gathered from the comparative case studies and the action research undertaken in the Department. The data is presented and discussed in this chapter.

7.1.2 Outline of this chapter

This chapter starts with an examination of feedback provided and perceptions of feedback at the start of this study. The chapter then goes on to discuss findings following modifications to practice. As previously, excerpts from the data provide representative illustrations. Further evidence was then gathered from the dissertation module as this provided a means of examining feedback from similar modules on disparate courses. Next is a discussion of these findings. The chapter draws from the findings and discussion to respond to sub-question three and finally there is a summary of the chapter.

7.2 Feedback and perceptions of feedback at the start of this study

7.2.1 The starting point - feedback provided

The starting point was to establish the nature of feedback provided in the comparative case studies and in the Department in order to identify routes to change practice. Feedback in the optometry course contained explicit reference to professional practice knowledge and skill development, as these excerpts illustrate.

> *Asking good questions.*
>
> *Too technical for Px* [researcher's note, Px is used in optometry as shorthand for patient].
>
> *Good use of prism bar.*
>
> *If plus is s/l, offer more plus.*
>
> *Reduced mark as slit lamp should have been performed*.

This was in sharp contrast with feedback provided in the Department. Much built environment feedback was concerned with development of students' academic Mode 1 knowledge, some of which related to the real world yet did not always develop students' efficacy as practitioners. There was also feedback which concerned material that had been omitted, contained errors or was deemed by the tutor as inappropriate. Some feedback contained direction for students to those areas requiring revision in order to develop their work and some was praise of the work.

> *Calculations could have more explanation.*
>
> *You have focused primarily on pollution caused by runoff and have not mentioned Quarrying.*
>
> *1994 regs are just too far out of date*.
>
> *Excellent evaluation of the roles, linked back to the relevant regulations.*

These feedback comments provided information about professional practice but did not help students to develop their skills as practitioners. The feedback concerned description of practice or some facet of it rather than improving students' efficacy as a practitioners. There was also feedback which related to academic matters. For example, built environment students were often directed to reference their work.

> *Citation needed.*
>
> *Don't forget to include references in Harvard referencing format.*
>
> *Good research topic, well supported by references.*

Together, these suggest that feedback in the Department was developing students' academic knowledge and skills of practice, but not their knowledge and skills as practitioners. In other words, Mode 1 knowledge and skills were the focus of feedback.

There was feedback in the Department which made reference to employability skills, the most common of which was communication and in particular report-writing which was incorporated within the brief and frequently the assessment criteria. Report-writing is an activity undertaken by built environment practitioners.

> *Well argued, structured, and presented as a report.*
>
> *Limited attempt at report writing.*
>
> *Give sources and captions on colour photos.*

However, the feedback did not make it clear that report writing is a form of communication and is an important employability skill. Consequently, students had no means from the feedback of knowing that they were developing such a skill nor its importance for their professional practice. This aligns with earlier findings from this research that built environment students have limited knowledge of employability skills (Vohmann and Frame, 2016) and suggests that providing clear information for students, for example in course handbooks, would make such feedback more meaningful and would help them to understand how their course linked with professional practice.

7.2.2 Perceptions and feedback.

7.2.2.1 Improvement

Next, it was necessary to establish the perceptions of students and tutors on these courses in order to understand the issues involved for each of the parties concerned. The start was to identify what students and tutors perceived as constituting feedback and its purpose. Findings revealed that all student focus groups identified feedback should help them to understand how they could improve their work. ‘Improve’ was the word used by students from each focus group.

> *I will use it to try and improve my next module* [built environment student, focus group D].
>
> *Being told that you’ve done this part well, that in future being able to improve on specific parts to be able to progress and to be better* [forensic science student, focus group Q].
>
> *How well or what you went wrong on or what to improve on* [optometry student, focus group N].
>
> *Areas you've done well in and areas you haven't done so well on, just need to improve on in the future* [built environment student, focus group F].

> *It's either positive and negative comment you receive back from the tutor, so you can vastly improve or understand what you need to improve on* [built environment student, focus group G].

That students perceive feedback as supporting improvement of their work matches findings of Mulliner and Tucker (2017). In other words, feedback is to help learning, although whether students' genuine goal was improved marks remains unknown.

Tutors also considered feedback as identifying positive and negative aspects of work and as helping students improve.

> *So you highlight the good points and the bad* [forensic science, interview FS 1].
>
> *With lab reports, I think what we try to do is, offer feedback on how they can improve things* [forensic science tutor, interview FS 3].
>
> *I give generic feedback on these were the areas where people did well, these were the areas that the class is a whole tripped up on and found the most difficult questions … I then offer an individual feedback session* [optometry tutor, interview Opt 1].
>
> *I've tried thinking of it from the perspective of what sort of feedback I would want if I was in their situation* [and] *try and contextualize it you know to current practice* [built environment tutor, Interview BE 2].
>
> *I focus on the things they need to improve on* [built environment tutor, interview BE 6].
>
> *Feedback, uhm, based on the marking criteria* [built environment tutor, interview BE 4].
>
> *Relates to the assignment* [built environment tutor, Interview BE 1].

These excerpts illustrated that the over-riding concern was to help students improve their work. To that end, tutors endeavoured to provide feedback they considered would be of most use to students.

However, although students and tutors regarded feedback as important, students did not always clearly recognise feedback. Tutors on all courses in this study held a perception that students often did not recognise feedback.

> *They think it's just us having a chat about how they could improve and they don't see that as being a form of feedback* [forensic science tutor, interview FS 4].
>
> *I don't know if they recognize that that is actually feedback on their-their work* [built environment tutor, interview BE 2].

> *But I think, where the problem is with feedback, is that the students don't know they're getting it* [built environment tutor, interview BE 10].

Tutors perception were confirmed by students' hesitancy in recognising formative feedback. As this excerpt illustrates, students struggled to recognise feedback.

> *I suppose that's feedback. Sort of mid-module feedback* [built environment student, focus group C].

Consequently, tutors felt the need to highlight for students when they were about to provide feedback. This may have been because the NSS impinges negatively on tutors emotions (Sabri, 2013) and so tutors were concerned for that reason to highlight this for students.

> *We did start thinking about-- one point we thought getting little lollipops on sticks saying "This is feedback to use in the clinics"* [optometry tutor, interview Opt 1].
>
> *Every time we give them feedback we say "this is your feedback"* [optometry tutor, interview Opt 3].
>
> *But I do always say, "this is formative, this is your opportunity for formative feedback"* [built environment tutor, interview BE 6].

Tutors alerted students to the imminent provision of feedback, yet this did not help students to understand the feedback or to know how to use it. In respect of learning, it may not matter whether students recognise feedback as such, what is important is that they use feedback to support their learning. However, the emphasis was to ensure that students knew they were provided with feedback rather than helping students to use the feedback.

7.2.2.2 Feedback and marks

Built environment students' correlated summative feedback with the mark awarded, expected that the two would align and that feedback would explain how their mark had been finalised.

> *I'd expect it to start with numerical grades that I've achieved for that piece of work and then I would expect the break down because all of the modules are set out with different areas of how you can achieve the grades. I expect feedback on each of those areas* [built environment student, focus group D].
>
> *Validates the mark you've been given* [built environment student, focus group F].

Because you think, "*I've got the grade, I know I must be doing something right, I don't need to pay any attention to any comments raised"* [built environment student, focus group G].

The mark awarded for a piece of work had considerable weight for built environment students, which is understandable as some marks contributed towards the classification of their award. It has been recognised elsewhere that tutors often believe students are more interested in marks than feedback (Weaver, 2006). Findings in the action research suggested that marks were a focal point for students in the Department and that they correlated this with their feedback, expecting the two to link and feedback to validate the mark awarded. This also suggests that summative feedback was perceived by students as having limited usefulness, and that formative feedback on drafts of their work held greater value.

Tutors in the Department also perceived a connection between marks and feedback, and that feedback had a role to play in justifying or explaining why a particular mark had been awarded.

It should justify the marks [built environment tutor, interview BE 1].

You can say to a student, "well, you've got, you know, 15 out of 20 for that, because you really, you know, you really got to grips with it" [built environment tutor, interview BE 6].

Together these suggest that students and tutors regarded marks and feedback as interconnected but their motives for linking these were different. Tutors concern was to justify the mark awarded, possibly as a defence mechanism; students' goal was understanding why the mark was appropriate and how it linked with their work.

7.2.2.3 Feedback and professional practice

When asked whether feedback helped develop their professional practice skills for industry, optometry students' responded positively.

Definitely, yeah [optometry student, focus group O].

Yeah [optometry student, focus group P].

However, built environment students response was entirely different.

The feedback doesn't necessarily help [built environment student, focus group E].

Personally no [built environment student, focus group F].

Don't know [built environment student, focus group G].

It was evident that built environment students perceived a gap between feedback and professional practice. This represents a problem because the object of these courses is to prepare students for industry and to become chartered (see for example Anglia Ruskin University, 2018b). If feedback is not perceived by students as supporting their learning and development for professional practice then this suggests that there is scope to modify feedback to better meet students' needs. This aligns with findings of earlier work in the Department (Vohmann, et al., 2015), that feedback makes limited reference to professional practice leaving scope to enhance practice in this respect.

7.2.2.4 Dialogue

Feedback as dialogue was used to good effect by optometry students and perceived as a two-way support for their learning and development. Such dialogue was partly within a tutor-student context and partly dialogue between professionals as equals.

> *If it's a clinic, I'll give my reasoning to why I thought this would have worked, and we-- they'll give their reason why they think it should go that way. And, yeah, Yes, it's-- Yeah, it is a dialogue. They they'd explain what, how they think, you know, it should have been. I'd say why I did the way I thought, and then we'd be able to have a conversation about it* [optometry student, focus group O].
>
> *At the end of your test, for each one, they actually discuss what you're doing well, and what you need to work on* [optometry student, focus group P].

This aligns with findings of Ajjawi and Boud (2017) regarding the value of two-way dialogue. In the Department, students' perception of feedback as dialogue for learning was more muted. Built environment students regarded dialogue as opportunity to ask questions as well as discuss.

> *I suppose verbal feedback would be good, as well. So, we could have a discussion so we could ask any questions* [built environment student, focus group D].

However, in sharp contrast with the comparative case studies, built environment students also viewed feedback dialogue as being adversarial; they were the only students in this study to do so.

> *But I'm assuming you're going to challenge it to the lecturer face-to-face* [built environment student, focus group F].

It is unclear why built environment students took such an adversarial approach, although possibly part-time students were influenced by their professional practice

experience in an industry recognised as suffering from conflict (Black, Akintoye and Fitzgerald, 2000). Nevertheless, this suggests feedback is perceived by built environment students as information and discussion for improvement, but is also a point of confrontation and conflict, perhaps with a view to increasing the mark awarded.

7.2.2.5 Formative and summative feedback

For optometry students, formative feedback was evaluated as helpful; it was immediate and it helped them understand how to improve their work.

> *So then there'll be feedback afterwards. So it's good because like last week I tested three patients, after every patient I had my feedback so when I got to the third patient the mistakes I was making the first-- with the first patient - I knew better. I knew not to make those, and s-supervisor herself said that she noticed the improvement from the first patient to the third patient* [optometry student, focus group O].

Built environment students perceived a degree of variability in provision of formative feedback, as the following discussion illustrates.

> *I don't feel that a lot of students do get feedback from tutors prior to submission* [built environment student 1, focus group G].
>
> *Yeah, I do. I think yeah the level of feedback prior to submission I think is brilliant* [built environment student 4, focus group G].
>
> *I think, yeah, the level of feedback prior to submission, I think is brilliant* [built environment student 2, focus group G].
>
> *Again, it's tutor by tutor* [built environment student 3, focus group G]

This suggested an inconsistent approach to feedback in the Department.

There was no difference between built environment and the comparative courses in terms of tutors' perception regarding their provision of formative feedback.

> *Face-to-face feedback is probably the most type of feedback* [optometry tutor, interview Opt 1].
>
> *But we have things in place where we always have, um, feedback sessions* [forensic science tutor, interview FS 3].
>
> *I've already said to them since week one, you can show me your work. Generally, at the end of the classroom teaching session for some formative feedback* [built environment tutor, interview BE 5].

The tutor's recognition of improvement suggested that there was an ongoing feedback relationship. Optometry students kept a feedback log. In other words, feedback was not

a stand-alone activity but part of a continuing dialogue which supported their learning. This is developed in Chapter 9. No evidence emerged of such an approach in the Department.

Some tutors used formative feedback in class as a pedagogic device.

> *It's just guidance really, about how they could improve their overall mark* [forensic science tutor, interview FS 3].
>
> *I give generic feedback on these were the areas where people did well, these were the areas that the class is a whole tripped up on and found the most difficult questions* [optometry tutor, interview Opt 1].
>
> *We give them feedback as part and parcel of the lectures* [built environment tutor, interview BE 2].
>
> *I often give questions to students who will then answer them and then we discuss the answer and see if it's near the mark or way off the mark* [built environment tutor, interview BE 3].

Tutors goal was to support learning and enhance opportunity for students to improve their assessment performance, which was to achieve better marks. Whether students engaged with formative feedback a great deal or very little cannot be known, and it would have been difficult for tutors to know.

Summative feedback proved entirely different and remained a source of dissatisfaction for students and tutors. Students expressed dissatisfaction with written comments.

> *there wasn't a great deal of information and some of it saying this section is good, but it didn't say why it was good* [built environment student, focus group C].

For tutors there was a perception that many students did not use summative feedback.

> *I find that a little bit of a galling experience* [students not attending individual summative feedback session]*, I don't know how to make them come, the ones that need the feedback* [optometry tutor, interview Opt 1].

This also suggests that the tutor considered dialogue as important feedback for learning, particularly for weak students. One student in this study acknowledged that they did not always collect their marked work.

> *I know certainly for me I've left a couple of pieces of work at the i-centre and I've never collected them* [built environment student, focus group G].

Built environment tutors perceived formal written summative feedback as of limited use or value because it was produced after the assessment task has been completed.

Putting it at the end of a formal feedback sheet is, is lost [built environment tutor, interview BE 1].

Formal feedback is too late in the day and comes in after the module is over [built environment tutor, interview BE 2].

No tutor in this study expressed a perception of summative feedback as being valuable. This is important because it raises questions concerning the perceived efficacy of institutional feedback protocols. Built environment tutors articulated a perception that summative feedback was largely a waste of time and effort, the reason being that many students did not read summative feedback as it was too late to modify their work. Tutors' perception was supported by the i-centre manager, who advised the researcher that approximately half of the marked work remained uncollected by students and was ultimately destroyed. [Researcher's note: the i-centre was the office where built environment students submitted their assignments and subsequently collected them following marking and the addition of written feedback]. Although this figure of half was an estimate, nevertheless it was a compelling indication that a significant proportion of summative feedback remained unread. This suggests that students and tutors functioned as if modules were separate silos of learning with few or no connections. Whether they believed this is a different matter, but nevertheless this finding suggests they functioned as if they were separate.

It is worth noting that the university had an online submission facility, Turnitin. During the course of this research, Turnitin was used in only one module. All other coursework submissions were paper-based. This meant that tutors had to print their feedback and add it by hand to students work and additionally that there was no electronic similarity check.

7.2.2.6 Summary

Unlike the comparative cases, there was no focus on feedback for professional practice development in built environment feedback, but instead theoretically based feedback dominated. Consequently, unlike the comparative case studies, built environment feedback often did not link students work with professional practice activities to help their development for professional practice.

There was broad agreement between tutors and students as to what feedback should provide. However, in other respects there were subtle differences between them. Students valued formative feedback over summative feedback, with its opportunity to

revise their work and enhance their marks. Tutors recognised this and were willing to provide formative feedback. In the Department, such formative feedback was generally provided verbally and related to drafts in advance of final submission of the work (Chapter 7, Section 7.2.2.5). However, summative feedback was perceived by tutors as a waste of time as they believed that students had little or no interest in it.

Students and tutors each correlated feedback with marks in their own way. Tutors used feedback to justify the mark awarded as well as providing information. Students used the feedback as validation of the mark, which they took as a measure of the extent of their success. Interestingly, built environment students also held an adversarial perspective of feedback dialogue (Chapter 7, Section 7.3.2.4).

7.3 Findings following the action research changes to practice

7.3.1 Modified feedback

Feedback in the practice-based module which had modified assessment contained reference to the assessment activity which students had undertaken and also to students' efficacy as practitioners, as the following excerpts illustrate.

> *An excellent presentation overall, clear slides and balance of text, but remember your client – scope for* [company name] *logo/presence to have been stronger throughout, and be sure to spellcheck carefully – including the client name!*
>
> *A professional presentation of the team in appearance and attitude to both the briefing session and the presentation*.
>
> *Good consideration of sustainability in the discussions, but again this could have been highlighted as a key aspect of the developments, perhaps linking to other aspects of the presentation such as off-site manufacture?*

This feedback made reference to both academic and professional practice knowledge and skills, explaining what was good and where there was scope to enhance the work. In a sense the feedback mirrored that provided in optometry, in that there was clear reference to students' work as practitioners which in turn supported development of students' professional practice attributes.

7.3.2 Perceptions and feedback

7.3.2.1 Feedback and students MES responses

The second module with modified assessment was the researcher's construction economics module. As a theoretical module, the feedback could not be regarding students' efficacy as practitioners as this was not an activity practitioners perform. Further, it would not be appropriate for the researcher to analyse and evaluate her own data; the role of the researcher was to facilitate and evaluate the outcome of modification to practice of the action research (Gray, 2014). Consequently, it was decided to provide feedback as promptly as possible both by email and in-class. The outcome of these could be ascertained from responses in the free-text section of the MES and focus group data. Providing feedback quickly was something the optometry students had found beneficial, and so its usefulness for built environment students could be evaluated here.

In the event, only one student commented on feedback in the free-text section of the MES, although they did comment on the timeliness of feedback '*almost instant'*, and the tutor who they perceived as '*helpful'* and the feedback as '*informative'*.

> *How helpful* [the researcher] *is with feedback. Almost instant and very informative.*

This suggests that this student had engaged with the feedback and had found it supported their learning, that the researcher had achieved the goal of meeting students feedback needs. The first sentence identifying helpful and naming the researcher infers that feedback is not simply the provision of information regarding the work, but is a human construct, a dialogue which overlays the provision of information, and which as Long (2013) found may be enhanced or unwittingly damaged by the tutor. This highlights that feedback is more than objective information, it is a construction of meaning in the context of learning, and interaction is important for learning (Littleton and Whitelock, 2005).

Students' written comments in the MES for construction economics related to their perception of the quality of teaching and with concerns they had around the impending exam. The module lectures and supporting material were the same as previously and only updated in respect of current economic events, for example the prevailing rate of inflation. However, interestingly, students did make comments regarding the module content and delivery, as these excerpts illustrate.

> *The content is interesting.*

The subject matter is interesting and it's well delivered.

Very interesting.

So despite the researcher's best efforts, students, when left to their own devices, made little reference to feedback, suggesting that it was low on their judgement of what was important to them. A number of influences could have been at play here. It may be that, as tutors suspected, students did not recognise feedback and so did not allude to it. Alternatively, as the MES did not enquire about feedback, students' thoughts may have been directed elsewhere, to those topics which the MES addressed or it may have been that students did not realise they had received feedback. Whatever the reason, the fact remained that students made little reference to feedback.

7.3.2.2 Feedback and marks

As students' correlated feedback with marks awarded, it was imperative that they were able to perceive these as linked. This was evident in feedback in the researcher's module, and an example was one student who had read their feedback but could not link it with the mark, which was not what they considered as acceptable.

I'm aiming for 70% and I just-- I think if it's "a solid piece of work" why have I done so badly?' [built environment student, focus group T].

This student and the researcher held different interpretation of '*solid'* work. This highlighted the problem that written summative feedback can obfuscate meaning and sometimes act as a hindrance rather than a support for learning. This gap between written feedback and students was aggravated when students perceived feedback as not addressing their goal of understanding what they were to do to improve.

If you got a 70, or an 80, or a 60 or a 50, if it doesn't say why you got that, you don't know which bit to improve on or keep the same the next time [built environment student, focus group K].

What [could] *I've done to get another 17%?* [built environment student, focus group K].

These comments reflected built environment students' desire to improve the mark awarded, and that understanding how to secure a higher mark was their goal. This also identifies the importance of dialogue, which allows for areas of uncertainty or in need of clarity to be discussed.

7.3.2.3 Feedback and professional practice

Following the second cycle of action research it was important to evaluate students' perceptions of feedback in those modules with modified assessment. Therefore, four

focus groups of students were convened to establish students' perceptions of the modifications to practice in the revised modules. Findings revealed a clear shift of perception. Feedback was perceived as more focused on students' effectiveness as practitioners and issues which would have made a material difference to practitioners.

> *There was actually, because we spelled out the company name wrong and they pointed that out and that is important. Because if you've got a client that you're saying the wrong name to, they're going to think you're rubbish* [built environment student, focus group H].

The context of authentic assessment helped students to understand implications of their error, of why the feedback was relevant. When asked whether it had been a useful experience to have assessment that was a simulation of the real world, the reply was a tentative

> *I think so* [built environment student, focus group H].

This tentative response may have been because the experience had been challenging for students in each of Bloom's domains and required development of Mode 1 and Mode 2 knowledge. As one forensic science tutor observed in respect of the feedback produced

> *It really depends on the type of assessment that they've done* [forensic science tutor, interview FS 3].

This highlights the influence of assessment design on feedback produced. To provide feedback to help develop students practice-based knowledge and skills requires assessment which correlates with this.

7.3.2.4 Dialogue

The built environment tutor in the practice-based module used dialogue pedagogically.

> *… putting ideas on the board and then we talked around them or we watched some films and talked about them* [built environment tutor, interview BE 14].

The tutors' support helped students to prepare, discuss and reflect on what the assessment required of them through a dialogue which was not a transmission of information (Long, 2013) but a sharing and a co-construction of ideas. The effectiveness of a social constructivist pedagogic feedback dialogue aligns with findings of Adair-Hauck and Troyan (2013). This is important because although there is research showing that students prefer individual rather than class-based feedback (Mendes, Thomas, and Cleaver, 2011), this class-based pedagogic use of feedback dialogue was perceived by students as helpful in developing their work. It may have

been because although not individual, all students could participate in the construction of meaning.

Additionally built environment students held an adversarial stance which was unchanged in the second cycle of action research, as these subsequent comments from the focus group reveal.

> *You can actually grill the tutor* [built environment student 4, focus group T].
>
> *Yeah* [built environment student 5 agreeing with student 4, focus group T].
>
> *Yeah* [built environment student 6 agreeing with student 4, focus group T].

This '*grill the tutor'* was in sharp contrast to the optometry students '*we'd be able to have a conversation about it*'. It remains unclear why built environment students held such an adversarial perception of feedback, although consideration must be given to context of the industry within which they operate, which as already has been noted contains a degree of conflict (Chapter 7, Section 7.2.2.4). So although students valued the feedback, nevertheless as a general approach there prevailed an underlying adversarial approach which was different from students in the comparative cases.

7.3.2.5 Formative and summative feedback

Having explained the difference between formative and summative feedback, built environment students were then asked which they preferred; a response was made simultaneously by three participants

> *Formative* [built environment students, focus group T]

Students perceived formative feedback as useful to improve their mark

> *That can you help you get a better mark there and then* [built environment student, focus group T].
>
> *Yeah and what I actually liked about you. You were actually willing to give us feedback during the kind of- throughout so you could then change kind of, um, your essay to make it better and better and better* [built environment student, focus group T].

It was a combination of tutor willingness, timeliness, and the ongoing nature of opportunity for immediate feedback in order to improve the mark that students appreciated. It is not known whether students perceived some tutors as unwilling, but this does link with findings of Long (2013), that there is a relationship dimension to feedback. Receiving feedback quickly matches findings of Mendes, Thomas and Cleaver (2011), although they found that what constitutes quickly remained uncertain. However, for students in the Department it was the combination of helpfulness with

‘*instant’* and ‘*throughout’* that were important. It is also possible that the formative feedback actively provided in each of the modified modules may have contributed to the improved mean marks.

In the practice-based module during the action research, formative feedback was embedded within the weekly programme of activities to support students learning. .

> *Week 11 was feedback and prep for the final… I wrote an individual feedback sheet for every single student* [built environment tutor, interview BE 14].

The students did not allude directly to this, but commented that in relation to assessment,

> *Also preparation leading towards it as well was quite handy* [built environment student, focus group H].

This suggests that possibly students may have understood this formative feedback as helpful support and not attached the label of ‘feedback’ to it.

However, a perception that students did not want summative feedback remained a source of dissatisfaction. Tutors perceived students as not reading summative feedback and that consequently producing it was a waste of time and effort.

> *They don't want the feedback, they're lying to you there* [built environment tutor, interview BE 15].

This is similar to findings of Dunster (2009) that built environment tutors perceived producing written summative feedback to some extent as a waste of time because not all students read their feedback. The phrase *“lying to you there”* could be considered provocative, but equally may be a reflection of something perceived as a source of frustration.

No evidence emerged to suggest that students in the Department reviewed the summative feedback they received from all of their modules. Some students said that they used feedback from one module to support their learning in subsequent modules.

> *I read it, I take it on board and I think, "Okay, how can I work on this to improve my next submission?"* [built environment student, focus group E].

However, given the number of students who did not collect their marked work (Chapter 7, Section 7.2.2.5) it was evident that many students did not make use of their summative feedback. Tutors’ perception that students made little use of feedback matches Evans (2013) findings. Optometry and forensic science students kept a feedback log which they used for reflection and to support their learning and

development. Reflection is a valuable skill in its own right for effective professionals (Schön, 1983) and as such is to be encouraged. Encouraging students to be reflective practitioners would support learning and also offers potential to help them integrate their academic learning and practice-based learning.

Feedback in modules that already contained authentic assessment supported development of students professional practice knowledge and skills, and linked their assessment with practice-based activities.

> *Don't forget, one of its main purposes is to provide information to an estimator*.
>
> *Most useful when it models what will actually happen on site.*
>
> *In general, it is better to complete the second fix for all trades before putting down the floor finishes*.
>
> *Be careful as the client does not themselves have to check.*
>
> *Some good points for the client to note.*

This feedback related to factors concerning the day-to-day activities of practitioners and provided information regarding the technical and practice-based aspects of students work. It was noticeable that the assessment briefs to which the comments related were based on professional practice activities. Further, these comments were made by tutors who possessed considerable professional practice experience, which aligned with findings of Chapter 6, that the extent of tutors own practice-based experience was an important contributor to the design and authenticity of assessment briefs.

7.3.2.6 Employers and feedback

Employers had no perception or knowledge of their employees receiving or benefitting from feedback at any point during this study. When asked whether they were aware of their employees using feedback to help in their professional activities, their responses were negative.

> *I'm not aware of that'* [practitioner interview 2].
>
> *If a lecturer gives some feedback to the student it doesn't always find its way all the way to the employer* [practitioner interview 3].
>
> *But it isn't something that I've seen a piece of work that's had feedback and then I think, "Oh yes little Johnny is using that feedback when he's dealing with Joe Blogs"* [practitioner interview 4].
>
> *No* [practitioner interview 6].

It is perhaps unsurprising that employers had no perception of feedback influencing their employees' professional activities because feedback is only one part of students learning and is remote from employers. Further, as students made little reference to feedback in the MES and perceived feedback as opportunity to improve their marks, this suggests that they would be unlikely to communicate any feedback comments to their employer. It is also worth considering whether employers would have an awareness of feedback provided changing student behaviour, as it would be difficult to separate the influence of feedback from the influence of other formal learning activities or from learning that had occurred in the workplace. Employers' perceptions were summarised by one employer as

> *I think ultimately they learn pretty much everything on the job* [practitioner interview 2].

This is an important statement as it suggests a perception of a gap between the real world and formal learning, and that the employer did not necessarily appreciate skills such as writing skills developed in formal education as having value for the workplace. This also underscores that employers perceived practical experience as a significant source of learning and gives weight to the need for students to develop their practice-based knowledge and skill in each of Bloom's domains through their formal studies. Authentic assessment with allied feedback has a role to play here in supporting students' development and preparation for industry. Simulation, which is what authentic assessment provides, offers opportunity to learn "tacit and embodied behaviours, and social ways of working that elude capture by other means" (Kneebone and Woods, 2012, p.2).

7.3.2.7 Summary

Dialogue and the creation of meaning is central in feedback and is important to support learning. Yet miscommunication can easily prevail, particularly in written summative feedback where there is no opportunity to clarify meaning other than if students arrange to meet their tutors. To an extent dialogue in the Department is perceived as adversarial and tutors written feedback as information and justification for the mark awarded. Feedback dialogue used pedagogically in the practice-based module was effective in creating a co-construction of learning activities which students perceived as helpful for their learning, and in this shared experience was not adversarial.

7.4 Dissertations and feedback

Findings from the action research suggest a correlation between assessment design and the nature of feedback provided. Consequently, the researcher wanted to establish whether, with the same or similar brief, tutors would produce similar feedback. There was no single module which was used on each of the courses in this study. However, the dissertation module contained a high degree of similarity between the surveying, construction management, BSc civil engineering courses and each of the comparative courses. Each of these dissertation modules required students to produce a dissertation of between 9,000 to 9,500 words in length on a subject relevant to the course. Feedback data was gathered from dissertation module on these courses and the two comparative courses.

Findings from this data revealed that feedback in the comparative courses, just as in the Department, focused almost entirely on academic matters and did not address issues concerning professional practice activities, as these excerpts from optometry illustrate.

> *Writing and formatting: Introduction could be more detailed with prevalence figures about the conditions being discussed in the dissertation. Do not combine or shorten words such as wasn't.*
> *Some of the Figures and Tables were not appropriately labelled.*
> *The referencing style was appropriate.*
> *The referencing style does also not meet the Harvard style standards.*
> *Most of the discussion relate to diabetes induced cataract. Structural and functional effects of diabetes on posterior eye was not equally addressed*.
> *Chapters on dyslexia and dementia illustrate that the candidate has read around the topic, bringing in studies including those with deficiencies in reading to help understand the process of reading in normal vision.*

Reference to professional practice was focused on theoretical aspects of the discipline rather than day-to-day activities undertaken by practitioners. This suggests that assessment is an important influence on the design of feedback provided. It was striking that feedback on these courses was similar to that produced in the Department for the dissertation module, as may be seen in these extracts.

> A *detailed and well written literature review.*
> *This looks like a relevant reference, but more context is needed for the reader to understand.*
> *Very brief consideration of ethics.*

Nice level of detail - could be more succinct.

Drawing sections would clearly illustrate these façade techniques.

This suggested that assessment design influenced the nature of feedback produced and the extent to which it focused on academic issues or professional practice activities. This highlights the significance of assessment design on feedback. As feedback is important to support learning (Hattie and Timperley, 2007), this suggests that assessment design has consequences which stretch beyond activities students undertake to include the feedback generated. Further, authentic assessment leads to an increased likelihood that feedback may relate, at least in part, to professional practice activities, and this may include formative feedback as well as summative. This carries the advantage of helping students understand the practical application of their studies and may help students to take a deep approach to their learning and development in readiness for industry.

7.5 Discussion

Feedback on performance is usually “the most important factor in learning” (Eraut, 2004, p.803). This highlights the importance of assessing students on their performance as practitioners in order to prepare them for industry and using feedback to help further develop their knowledge and skills. It seems likely that tutors will continue to be required to produce written summative feedback in addition to any formative feedback tutors may choose to provide. Reasons for this are partly to provide a learning opportunity for those students who use it and partly as integral to institutional HE Quality Assurance processes, which as Dunster (2009) observes are more to do with measuring tutor performance than supporting student learning. However, students’ perception regarding the use of feedback was to use it to improve their work, and by implication their mark, their focus was on the mark achieved. Students reported that they sometimes used summative feedback on future learning, although evidence suggested that formative feedback was the subject of their attention and summative feedback was less widely used as formative feedback on subsequent learning. Providing feedback during the learning phase (Croy, 2018) is pedagogically an important dimension of feedback and supports students in a timely way. However, in respect of summative feedback there was a difference in perception. Tutors perceived producing summative feedback as a waste of their time and effort. This matches findings of Havnes, et al., (2012), that tutors perceive students as being more concerned with marks than feedback. Students’ limited use of summative feedback

suggests they do not take feedback from one learning experience to another and by inference perceive their learning as being in separate ‘silos’.

Optometry feedback provided students with clear information regarding the effectiveness of their performance as practitioners and, where appropriate, guidance as to how they could improve. In other words, the feedback supported students’ development as practitioners, developing their industry knowledge and skills as they undertook activities which simulated the work of practitioners. Importantly, the feedback also reflected the practice-based nature of activities that students undertook. This is an important point because the central goal of this optometry course is to develop students’ knowledge and skills in order for them to be able to progress and “register as a fully-qualified optometrist” (Anglia Ruskin University, 2018d). Built environment courses had the same goal, for example the quantity surveying RICS accredited course intended that graduates would “be able to register with RICS and work as a chartered quantity surveyor” (Anglia Ruskin University, 2018b). However, the feedback did not always support development of such skills with the same degree of practice-based focus as in optometry. Hope, Garside and Prescott (2011) found simulation an effective contributor to students’ preparation for the real world which helped them connect theory and practice. Findings here suggest that simulation activities provoke allied feedback which in turn further supports development of students’ knowledge for professional practice, a virtuous circle.

The majority of built environment lecturer feedback – 67.3% from a total of 52 of items in the first cycle of the action research - did not make an explicit link between students assessed work and professional practice activities. Feedback tended to be about academic issues pertaining to students work, for example use of Harvard referencing. This is particularly important point as development of students’ practice-based knowledge and skills is a goal for courses in the Department, which seek to develop students’ knowledge and skills for professional practice and ultimately for PSRB membership (see for example Anglia Ruskin University, 2018b). However, links between assessment feedback and professional practice were often, at best, opaque. Only 8% of feedback in the first action research cycle made explicit reference to professional practice. This meant that students often had to make their own connection between feedback they received and professional practice activities. Li, Hyland and Hu (2017) found that 64.1% of feedback points related to academia and only 17.9% concerned the professional world, and although their work related to postgraduate education courses, nevertheless these are similar findings and a clear indication that

feedback often is largely concerned with academia. It is perhaps inevitable that feedback is unlikely to be connected with professional practice activities if it is based on assessment produced in response to an inauthentic brief. Therefore, contextualising feedback in relation to professional practice offers opportunity to enhance the value of feedback and the learning experience.

Reference in feedback to professional practice activities was explored further in the second cycle of action research. Findings from this revealed that on the practice-based built environment module with authentic assessment, 55% of the written summative feedback (Appendix Q) clearly connected students' work with activities a practitioner might undertake, for example, '*a professional presentation in both appearance and behaviour'.* This was very different from the feedback produced on inauthentic assessment and in the first phase of the action research, which did not explicitly link students work with practice-based activities. Authentic assessment provided an important underpinning ingredient in the construct of feedback which was meaningful to students. For example, misspelling a client's name was recognised as a small but important error which would make a client think '*you're rubbish'*. The context authentic assessment provided helped students to understand the significance of feedback: a small yet potentially important error could prove problematic in professional practice. This is an important point because it highlights that feedback is not a stand-alone activity, but is an integral part of learning and interlinked with students' assessment activities. Context can be part of authentic assessment and support learning in each of Bloom's domains, support students development of Mode 1 and Mode 2 knowledge, and, in a Vygotskyan sense helps to prepare them for industry.

Built environment students received summative feedback at such a point in time when there was no opportunity to apply it to their current learning. Summative feedback is recognised in the ARU student charter (Anglia Ruskin University, 2017b); formative feedback is excluded from the charter. This suggests an assumption that summative feedback will be used by students as integral to their development, although there is no formal mechanism to support or promote this. Summative feedback was a frustrating experience for tutors in particular as they perceived it as a waste of time and effort. This suggests that much work remains to be done to encourage students to make use of summative feedback in future learning.

The fact that approximately half of the marked work remained uncollected matches findings of Winter and Dye (2004), who found that a significant proportion of students

did not collect their marked work. Built environment tutors held a suspicion that of those students who collected their marked work, few read the summative feedback: '*I don't think many of them look at their feedback'*. This is similar to findings of Lilly, Richter and Rivera-Macias (2010) that many students seemed not to make use of their feedback from previous modules. Similarly, Harrison, et al. (2015) found that summative feedback was not always effectively used. Summative feedback remained a vexed issue in this research. It may be that students considered that after their work was marked there was nothing for them to gain as the mark could not be increased. If so, this further suggests that students regard their learning as being in silos, having few connections between modules and implicitly perceiving feedback in one module having little or no applicability for subsequent learning. This is important because summative feedback represents an opportunity for learning from and between modules and also to help integrate the course. If students were to use summative feedback in subsequent modules this would add positively to their learning experience. However, there was no protocol in the Department to encourage students to make use of their summative feedback, clearly representing an unexploited opportunity for learning. This suggests an area for potential enhancement - establishing a protocol to ensure that students engage with their summative feedback and use it, where possible, in their subsequent learning (Chapter 9, Table 9.3).

Written feedback provoked an emotional response in 40% of built environment students' focus groups, the most striking of which was represented by an indignant and adversarial reaction, '*you can challenge it'*. It may be that such a response reflected the adversarial ethos of the construction industry (Crompton, 2016), an ethos which part-time built environment students could experience in the workplace. That feedback can produce an emotional response in students' matches findings of Bodman (2007) and Rowe, Fitness and Wood (2014). This is important because the emotions which feedback engenders can have an adverse influence on learning, and may even damage some vulnerable students (Long, 2013). Following the second cycle of action research with modified assessment, there was no change in built environment students emotional response to feedback. However, the problem for tutors is that they cannot know how each student may react to feedback, the emotional response that it may provoke and any consequent effect on students learning. This remains an intractable challenge for tutors yet one to which they should remain alert as it carries consequences for students' learning.

Findings of this chapter suggest that assessment and assessment feedback are inter-related. This work contends that authentic assessment and allied feedback offers scope to enhance the work of the Department. However, it is recognised that there are challenges to design authentic assessment and to ensuring that feedback is effectively used by students. Therefore, every effort should be made to achieve this goal to enhance the student learning experience, offering students the opportunity for practice-based learning in the safe environment of the classroom.

Professional practice experience can be a strong influence on tutors' pedagogic work (Potts, 2011). These tutors provided authentic feedback which had focus on practice-based Mode 2 knowledge and skills, offering scope to develop students learning as well as Mode 1 theoretical knowledge. Tutors own experience was instrumental in shaping their interpretation of what constituted appropriate assessment and subsequent feedback. Thus, it was tutors' epistemological position (Clancy, 2013) which influenced their assessment design and by extension their feedback.

7.6 Response to sub-question three

This chapter addresses the third research sub-question, which is as follows.

> ***How can feedback on assessment be designed and used to reinforce learning in the context of professional practice?***

The start of producing feedback which helps learning in the context of professional practice lies with the design of authentic assessment. Such assessment engenders design of feedback which explicitly links students work with professional practice and which helps students understand what they did well as practitioners and potential consequences of their actions and helps students to develop professional practice skills.

Designing authentic assessment is an important start to providing feedback regarding students' efficacy as practitioners and thereby helping them to develop in relation to their own personal professional practice. On courses in the Department, composed of practice-based and theory-based subjects, authentic assessment may take a number of forms and is not constrained to undertaking professional practice activities (Chapter 6).

Increased use of formative feedback dialogue would help students develop their practice-based knowledge and skill development, as this would allow them to implement the feedback in advance of submission. Such a dialogue can remove some of the misunderstandings that occur in written feedback with its lack of opportunity to clarify meaning. Such dialogue can be timely and can provide opportunity for students to use the feedback as a learning device and to enhance their work.

Having provided effective summative feedback, it is important that students collect, read and then use their feedback. It would be appropriate to have a Department protocol to ensure that students undertake this activity. This should extend to ensuring that students use their summative feedback formatively, in addition to feedback that is demonstrably formative. For example, an assessed reflective log developed throughout the course would help achieve this goal.

Providing feedback guidance to help students understand what is meant by feedback would make explicit those issues which remain implicit or hidden and for students are opaque. Such guidance should be provided to students at the outset of their course, and is developed in Chapter 9.

7.7 Summary and conclusions of this chapter

The data established that students and tutors hold different perceptions regarding the creation and use of feedback. Feedback remained a source of dissatisfaction for students and tutors, for different reasons. Students did not always understand the feedback, tutors considered producing summative feedback as largely a frustrating waste of time. Following the action research revisions to practice students' more clearly understood the value of feedback provided and skills that they were developing, and the context provided by the authentic assessment was instrumental in supporting students' appreciation of feedback. Students valued professional practice knowledge development rather than academic knowledge development, and context in authentic assessment played an important role in supporting their learning in this respect. Formative feedback was also appreciated by students as it allowed them to improve their work, and so could be considered as enhancing their learning.

Having examined how feedback can be designed and used to reinforce learning in the context of professional practice the following chapter considers how students can gain

the most value from feedback on assessment in relation to their own personal professional practice.

Chapter 8 Presentation of Findings Regarding Research Sub-Question Four

8.1 Introduction

8.1.1 Purpose of the chapter

The previous chapter examined how feedback on assessment can be designed and used to reinforce learning in the context of professional practice. The purpose of this chapter is to address research sub-question four, which is:

> ***How can students gain the most value from feedback on assessment in relation to their personal professional practice?***

Professional practice is at the heart of accredited built environment courses and supporting students' development as effective practitioners is a goal of these courses in order to meet the needs of students, industry and the economy. As such these courses present theoretical and practice-based challenges for students learning. In order to realise the value of their course, it may be helpful for students to embrace these diverse challenges and understand the relevance of each for their own personal professional development.

Feedback is important for students' learning and development (Li and De Luca, 2014), and so could be used on these practice-based courses to contribute to professional as well as academic development of students. As the courses under scrutiny are practice-based, so feedback could help students to synthesise Mode 1 and Mode 2 knowledge to enhance their learning and development as effective industry practitioners (Chapter 3, Section 3.3).

8.1.2 Outline of the chapter

Section 8.2 presents the findings of this chapter which addresses the fourth research sub-question. As previously there are extracts from the data to illustrate findings. The chapter starts with an examination of students' perception of feedback as supporting their development for industry, and their perceptions of feedback in the practice-based module with modified assessment. Findings from the comparative cases and action research are then examined. This is followed by a discussion of these findings and then there is a response to sub-question four. After this is a summary and conclusions of the chapter.

8.2 Findings of this chapter

8.2.1 Feedback and professional practice

Built environment students' perception of feedback as helping their knowledge and skills for professional practice was negative in the first cycle of action research

> *the feedback doesn't necessarily help* [built environment student, focus group E].

At the mid-point of their course and after modification to practice in the construction economics module, when asked the same question built environment students' responses were unequivocal

> *No* [built environment student 1, focus group T]
>
> *No* [built environment student 3, focus group T]
>
> *No* [built environment student 5, focus group T]
>
> *No* [built environment student 2, focus group T]
>
> *Not at the minute* [built environment student 4, focus group T]

'Not at the minute' suggests an expectation that in the future it might do so. It is unlikely that the action research would have changed students' perception in respect of this because at this time there had only been one module with modified assessment for these students. The students had completed two practice-based modules and were then at the mid-point of studying two more. This suggests that either students do not recognise feedback as developing their professional practice knowledge and skills or that the feedback related mostly to academic matters.

In the practice-based module which had modified assessment, feedback had a clear focus on professional practice, and this had its roots in the design of assessment, for example

> *I pointed out things like the group was really professional in approach* [built environment tutor, interview BE 7].

Importantly students recognised this real world emphasis, as one student noted

> *We did get the feedback on that, and relate it to the real world* [built environment student, focus group H].

So assessment which related to professional practice provided a springboard for feedback which helped students to gain further insight for their own personal professional practice development and to appreciate the real world relevance of the formal studies.

Together these findings suggest that feedback on students' effectiveness as practitioners should be explicit and also that students do not perceive feedback throughout their course as helping their professional development. These findings highlight the important role feedback plays in learning and that developing students as practitioners can effectively be extended to incorporate feedback on professional practice activities supported by the use of authentic assessment.

8.2.2 Actively engage with summative feedback

In order to gain most value from feedback it is necessary for students to actively engage with their feedback, including summative feedback. There were important dimensions to this, the first of which concerned students' limited use of summative feedback (see Chapter 7). It is important that students make use of summative feedback. However, there was an underlying perception that if the work achieved what the student considered a good mark then the feedback was not needed.

> *If you're happy with your mark, you're not likely to pay attention to such feedback or not pick up at all* [built environment student, focus group G].

This meant that those students who did not collect or engage with their marked work would not have evaluative information concerning merits and demerits of the work. This suggests that students perceived their assessed work as having a pre-determined goal and once met there was nothing further to be gained. Alternatively students may not have understood summative feedback as a powerful device for learning and development in subsequent modules, and helping them to appreciate the integrated nature of their course. Using summative feedback formatively would add synergy by providing a holistic experience, helping students to understand their course as integrating academic and professional activities rather than perceiving learning as being in separate silos or parcels.

Use of summative feedback formatively was mixed. Some students had articulated a perception that feedback was of limited value if their mark was '*good'*, others reported that they used summative feedback formatively in their subsequent learning.

> *I will use it to try and improve my next module* [built environment student, focus group D].

This represents a missed opportunity. It is possible that many students had not considered the possibility of using summative feedback formatively or that they were unsure how to do so on these courses which demanded mastery of a diversity of thinking skills.

8.2.3 Feedback as emotion

In the second cycle of action research, in the researcher's theoretically-based module students valued the formative feedback provided. However, their focus surrounded the helpfulness of the researcher and usefulness of the feedback as information to improve the work rather than its value for their learning or professional development (Chapter 7, Section 7.3.2.5). The helpfulness of the tutor was central to their construct of feedback dialogue and its role in making the work better. For these students this was founded on their perceptions of the tutor's willingness to help them; they made no reference to the quality of the feedback or its effectiveness beyond making the work better. This was further reinforced as one student then commented

> *Whereas there's quite a few kind of lecturers who don't even do that. Their whole attitude is very, very cold* [built environment student, focus group T].

This suggests that the emotional aspect of dialogue intersects feedback for learning. It was students' perception of tutor being *'willing'* to engage with them which was significant for students as well as the attitude of tutors who were perceived as being '*cold'*. The perception of a cold attitude was correlated with the perceived extent of the tutor's willingness to provide feedback. This matches Bodman (2007), who found that students appreciate and are motivated by tutors who positively engage with them. It is also similar to Long (2013), who found that emotions influence students in the feedback process, suggesting that tutors must consider how feedback may be interpreted by students and possible consequences.

8.2.4 Feedback and dialogue

Built environment students conceptualised feedback as a means to improve their work in a cognitive paradigm. They made no reference to enhancing their learning, only to making their work '*better'*, and by implication secure a better mark.

> *I can then ask questions about whether I could improve or something on areas, or where things were lacking or how I've completely misunderstood you or have I actually grasped what I was supposed to be doing* [built environment student, focus group D]
>
> *During the course of the module, queried items with the lecturer to say, "I'm a bit stuck here", or "How do I do that?", or "How about doing it this way? Is that correct or is it better done in an alternative manner," to make sure I'm heading in the right direction. That's been very useful* [built environment student, focus group E].

This did not change in the second cycle of action research. This suggests that built environment students tend to take a shallow approach to their learning. This was in sharp contrast with optometry students' perceptions of feedback as a student-tutor discussion of student's performance which would help them to improve their work.

There was a further aspect of feedback dialogue. In the second cycle of action research it emerged that built environment students, although pleased with the provision of formative feedback, were reluctant to ask questions when they did not understand summative feedback.

> *I've looked at* [the feedback] *and I still don't know what I've done wrong* [built environment student, focus group T].

This suggests engagement with feedback but reluctance to discuss with the tutor, meaning that feedback remained a frustrating experience. To discuss with a tutor following completion of a module requires the student to arrange a meeting with their tutor to discuss the feedback. However, as Blair and McGinty (2013) found this can be difficult in practice and may be influenced by students' confidence of their perception of how approachable their tutors are (Blair, et al., 2012). For part-time students in particular, with classes for most of their day of attendance at university, this can prove especially difficult. Further, summative feedback becomes increasingly divorced from the learning experience with the passage of time. Providing such one-to-one feedback for all students on all modules in the Department is impractical, not least because of the financial constraints on Higher Education which have long been recognised (Gibbs and Simpson, 2004) and the large class sizes which have resulted from these constraints. Consequently, tutors have to find routes to provide feedback for large classes, and this could include, for example, use of generic whole class feedback and peer feedback (Chapter 2).

8.2.5 Development of employability skills

Employability skills are valued by employers (CBI, 2012) and are included on built environment courses. The forensic science tutors had taken steps to ensure that students developed employability skills as well as their theoretical knowledge.

> *We've now increased a lot more um, presentations in the forensic science degree to try and step up their confidence skills in that respect* [forensic science tutor, interview FS 4].

This matched forensic science students' perceptions, as they recognised they were developing employability skills on their course.

> *In a module we have this semester, we do practical work on the scene of crime, and we are a group when we get a lot of teamwork and that will help us develop our transferable skills* [forensic science student, focus group Q].

They had, throughout their course been made aware of developing employability skills, and this included

> *We have something called employability week* [forensic science tutor, interview FS 3].

The course provided explicit employability guidance and support for students, clearly guiding them to understand these skills, their application and value.

The Department had no strategy to develop students' employability skills in such a clearly defined way, but implied that they would be developed through assessment activities and module delivery. Built environment students tended, even when they had been made aware of employability skills, to think about each module and its subject-based value, as this except illustrates.

> *In terms of getting feedback for a dissertation, no, I possibly won't use that feedback in the real world. But if I'm getting feedback on writing a dilapidation schedule or a building span report, then yeah, that will be a really good, um, criticism that I'd move forward with* [built environment student, focus group I].

Dissertation feedback was provided partly via one-to-one tutorials and partly via written feedback following submission of the finished work, and this suggests that the student did not link what they had selected for their dissertation topic as having relevance or application in industry. Built environment students exhibited a limited knowledge of employability skills expected in industry, the most commonly recognised one being communication, which matches findings of earlier work undertaken as part of this DProf (Vohmann and Frame, 2016). If assessment feedback was to develop students as practitioners, then it was appropriate that students understood what employability skills comprise and their value in industry. This has important implications for feedback as a learning device. Having been made aware of employability skills, students' still related feedback to those skills they perceived as directly relevant to their professional practice and held limited appreciation of employability skills outside specific subject areas. This suggests they may have limited appreciation of the need for skills and knowledge which lie outside the formal learning of a module.

8.2.6 Using reflection to support learning

Optometry students used an assessed log throughout their course to record feedback and as a learning device. This log helped them to reflect on their development and was also the basis of one-to-one discussions with their tutor. So far as could be ascertained, there was no comparable activity in the Department. However, such a log was perceived as valuable by the optometry students and was used by them to support their development.

> *We have our own little logbooks, as well, where you write down, um, any sort of areas, where you need to really need to work on. So that way you don't forget it for next time* [optometry student, focus group P].

Developing students as reflective practitioners through use of a reflective feedback log would support students' development as professional practitioners. Such a log would provide opportunity for students to observe their development in all of their modules throughout their course. Such a log could incorporate connections between Mode 1 with Mode 2 practice-based knowledge and would help students to appreciate the connectedness of their course. Therefore, a log is included in the toolkit (Chapter 9, Section 9.4.2). This would help students to appreciate that their learning, although undertaken in separate modules, is an integrated experience with the goal of preparing them for professional practice. This log would diminish the silo perception held by some students regarding their course, that modules have few connections between them and that the links between their academic studies and industry are weak. This would also help them to gain value from the feedback they receive and to use this for their own personal professional development.

8.3 Discussion

Built environment courses are multi-disciplinary, designed to develop students professional practice knowledge and skills. Practice-based courses such as those in the Department seek to prepare students for industry; feedback is one important part of this preparation. High quality feedback has been recognised as essential for students' learning and can facilitate students' development (Evans, 2013).

Optometry students conceptualised feedback as facilitating their development, positioning feedback dialogue within a "socio-constructivist paradigm" (Evans, 2013, p.71). In sharp contrast, built environment students asked questions concerned whether the work was '*correct'* or how to '*improve'*, rather than using feedback as a dialogue for

learning. Being able to improve was central to students' responses to questions around the use of feedback, seeking to understand how to correct errors in their work and so improve their performance and mark. This matched findings of Li and De Luca (2014). Pedagogic practice in recent years has become more constructivist but feedback has remained as transmission of information (Värlander, 2008) and this was the case for built environment students. For built environment students feedback was constructed as receiving information and asking questions to clarify their understanding of what was required, a cognitive paradigm of feedback. Discussion for them was transmission of information in which they wanted to grasp '*what I was supposed to be doing*'. In other words, students were engaged in shallow learning and possibly only developing lower level attributes in Bloom's taxonomy of educational objectives. Feedback as dialogue is an important contributor to effective learning (Nicol, 2010) yet apparently under-used and its function not fully understood by built environment students. Helping students to reconceptualise feedback dialogue in a constructivist paradigm would improve their learning by encouraging a deeper approach. The challenge for tutors in the Department is to encourage and facilitate students' re-conceptualisation of feedback as a constructivist route for enhanced learning.

Feedback is of most value during, not after, the learning experience (Brown, Harris and Harnett, 2012), and students particularly valued formative feedback (McCann, 2017). Tutors in the Department and the comparative case studies perceived formative feedback as more valuable than summative feedback, which they perceived as something of a waste of effort. The value of formative feedback lies in its provision as the student progresses through a module, when it is relevant to what the student is doing (Gibbs and Simpson, 2004). Using formative feedback pedagogically within module delivery offers scope to promote deep learning and support students' development. This highlights the need for summative feedback to be understood as formative for future learning. Such a use of summative feedback would help students to consolidate their learning and exploit this under-used resource.

Emotion is integral to feedback and can influence learning (Long, 2013). Built environment students' feedback concern focused around improving their mark, and having '*helpful'* tutors, rather than with learning. Their emotion in respect of feedback was a reflection of industry, having an adversarial or challenging stance. This represented a missed opportunity for learning, and suggests that students conceptualise knowledge (Chapter 2) as being composed of facts which they could acquire and reproduce in their assessment, and tutors as providers of those facts.

Reflection has been identified as a valuable activity for development of the individual and is important for learning (Schön, 1983). Students in the optometry used a feedback log as a means of scaffolding their reflective learning. However, in the Department there was no comparable activity which was used by students throughout their course. Consequently, the opportunity for reflection, including between modules, was unsupported. This meant that students were not actively developing an attribute recognised as important for effective practitioners, and may be been unaware of its existence or value. Only three built environment courses in this study offered students a reflective work-based or practice-based module. Students on these courses had a module with clearly identified reflective element. However, for the majority of undergraduates in the Department there was no similar reflective learning experience. Developing students as professional practitioners in preparation for employment in industry is at the heart of built environment accredited undergraduate courses, and this suggests that, in some areas, there is scope to enhance the use of reflection to help students' development.

Given the vocationally oriented nature of the courses under study and their accredited status it was interesting that neither students nor tutors explicitly engaged with the development of students' employability skills. These skills were addressed implicitly throughout the learning experience, but were seldom, if at all, made unambiguous for students. Built environment undergraduate courses are constructed around requirements of professional practice and PSRB demands, developing students' knowledge and skills in preparation for industry. Therefore, feedback should contribute to developing students' employability skills in order to help them prepare as industry practitioners, helping them to understand the nature and application of those skills.

Biggs (1996) argues that constructive alignment of teaching, learning and assessment is necessary to enhance the student learning experience. It is worth remembering that, for students, assessment is the focus of their learning activities. This research is concerned with the alignment of professional practice with assessment and assessment feedback. On professionally accredited courses, which seek to develop students as effective practitioners, it is appropriate to align feedback with professional practice as well as with assessment in order to support students' development for industry. This may require tutors to reconsider the nature of the assessment they provide or the strategies that are used to help students make the most use of this valuable resource.

8.4 Response to sub-question four

This chapter responds to sub-question four, which is as follows.

> ***How can students gain the most value from feedback on assessment in relation to their personal professional practice?***

Findings of this chapter suggest a number of routes for students to gain most value from feedback on assessment emerged from this work. These are provided below and developed in Chapter 9.

Students should engage with their formative and summative feedback, embedding summative feedback suggestions into subsequent work they undertake. Encouraging students through enhanced use of feedback would help them to undertake deeper learning, reflecting on their achievements and future challenges. Use of feedback integrating theory and practice would help students' personal professional development.

Students should be provide with support to become feedback literate. Such support would help students to understand the purpose and application of feedback, and would help them to understand how to use feedback, changing them from passive receptors of feedback to interpreting and responding to feedback (Carless and Boud, 2018). This would make a significant contribution to students gaining value from feedback.

Pedagogically, it would be beneficial if students were encouraged to reconceptualise feedback in a constructivist paradigm, as part of their learning rather than as information to secure higher marks. Such reconceptualising would promote deep learning, and could also be used to help students understand the connections between theory and practice. Therefore, students should be provided with information and support in order to help them understand this and be able to act on it.

Students should make full use of feedback dialogue with tutors to engage in the co-construction of meaning. This would support learning, helping students to understand the feedback and the appropriate response to make. Such co-construction, when used, helped students to take a deeper approach to their learning. This full use of feedback dialogue includes asking tutors when they were unclear about the meaning feedback.

The creation and use of a reflective feedback log would help students to gain most value from feedback. Use of a feedback log, as on the optometry course, would allow students to record and reflect on their feedback over the length of their course to further develop their knowledge (Chapter 9, Section 9.4.2). Such a log would help students to evaluate whether they had used feedback effectively in subsequent learning and allow them to note any trends or themes which emerged. This would alert students to those instances when they had not used feedback effectively and consequently they would be able to take remedial action to deal with any issue which might otherwise remain unresolved.

8.5 Summary and conclusions of this chapter

This chapter has established that there are gaps in built environment students' use of feedback and that consequently there is considerable potential to enhance this dimension of their learning experience. Feedback was under-used by students for a range of reasons, in spite of the fact that feedback is important for learning, which clearly represented a missed opportunity.

The comparative cases were useful in identifying practical means to provide students on professional practice-based courses effective feedback which allowed them to develop theoretical and practice-based knowledge and skills. This chapter has identified means by which built environment students can gain most from feedback. These practical routes to enhance the gain from feedback support students learning.

Effective intervention could help students gain most value from their feedback, and so enhance their learning and development in relation to their personal professional development. This chapter has identified causes of the limited use made of feedback and routes by which this may be resolved. To summarise, students would benefit from support to help them understand why enhanced use of feedback is important and practical support to help them use feedback effectively (Table 9.4).

The central message of this chapter is that students should engage with feedback in the context of their profession and professional practice during and beyond the formal learning phase of each module. Gaining most value from feedback would provide a synergy to the learning experience which currently is not fully realised. To gain most value from feedback, students should: actively engage with feedback; should ask tutors when they are uncertain as to the meaning of feedback; and, should make use of a log to

record and reflect on the feedback they receive. It is also necessary that tutors provide feedback dialogue as well as formative and summative feedback. Embedding feedback dialogue within the formal learning sessions may be helpful here.

This chapter is the last of four findings-based chapters in this thesis. The following chapter, drawing from the four data-based chapters and from theory, provides a discussion of these findings.

Chapter 9 Discussion

9.1 Introduction

9.1.1 Purpose of this chapter

The purpose of this chapter is to provide an extension and synthesis of the discussions contained in each of the previous four chapters and to address the central research question. Facilitating exploration of the issues pertinent to this research, the central research question provided a focus to address the problem under investigation, which is as follows.

> ***How can assessment be made more authentic to professional practice and, allied with assessment feedback, enhance built environment undergraduates' learning experience?***

Built environment courses in the Department are designed and operated within the regulatory frameworks of ARU and of the relevant accrediting PSRB, taking into account needs of industry. A goal of these courses is to develop students' knowledge and skills in preparation for professional practice; assessment and assessment feedback are an important means to achieving this goal. This work identifies mechanisms and processes which would enhance assessment and assessment feedback in order to enrich the learning experience provided in the Department. This concern is addressed in this chapter through a review of the central research question and provision of an assessment and assessment feedback toolkit derived from the findings of this research.

9.1.2 Outline of this chapter

This chapter contains five sections. Following this introduction there is a review of the central research question to discuss findings of this work in light of theory and existing research drawing from the previous four chapters. In summary, there were a number of advantages of authentic assessment and these each helped to enhance the learning experience for built environment students and better prepare them for professional practice. Next, there is an evaluation of the action research process undertaken for this research. This includes an overview of the activities undertaken and how the work unfolded, obstacles that cropped up, positive events that were valuable in this research and the researchers own modifications to practice. This is then followed by a toolkit regarding assessment and assessment feedback for built environment tutors which is developed from findings of this research. The toolkit provides a framework to enhance

the assessment and assessment feedback aspect of the student learning experience and to support students make best use of feedback. Finally there are the conclusions of this chapter.

9.2 Review of the central research question

9.2.1 Overview

This thesis has explored authentic assessment and assessment feedback in relation to professional practice knowledge and skill development for built environment undergraduates to enhance their learning experience. Assessment is embedded with interpretation of what knowledge is appropriate and how to assess students understanding of that knowledge (Croft, 2015). This study has been concerned to understand the perspectives of those involved with assessment and assessment feedback in the Department and, therefore, has taken an anti-positive and interpretive paradigm (Crotty, 1998). The methodological approach was action research and to help generate ideas for modifications to practice, comparative case studies were used. The action research was selected because it would allow the researcher to promote and evaluate modifications to practice with the goal of making improvements, including to the researchers own practice (Gray, 2014). This was necessary because this DProf is concerned with contributing to solving a real world problem. The comparative case studies was composed of two accredited courses which were in the same Faculty as the Department. These provided an effective contrast with the Department, but operated within the same Faculty assessment and feedback protocols and prepared students for professional practice. The contrast of these courses gave the researcher insight into assessment and feedback on other practice-based undergraduate courses and so helped inform the action research of this study. The comparative case studies also provided insight into the significance of context for assessment and learning.

Assessment design that contained authenticity to the real world provided opportunities for undergraduates to develop their practice-based knowledge and skills (Raymond, et al., 2013), which inauthentic assessment did not effectively achieve. Further, inauthentic assessment was evaluated less favourably by students than was authentic assessment. Yet neither PSRB documentation nor Department or university protocols always encouraged tutors to use authentic assessment in order to help students develop appropriate knowledge and skills for their professional development. Other studies have also found a gap between employers' expectations and graduates preparedness for

industry. Poon, Hoxley and Fuchs (2011) found a gap between employers' expectations and what they felt real estate graduates had attained from their studies in Real Estate RICS accredited courses. Poon (2012) also found that employers consider graduates insufficiently prepared for professional practice. Similarly, findings in this thesis reveal that employers perceived most relevant learning as happening in the workplace. Closing this learning gap between university study and industry needs has the potential to improve the built environment undergraduate learning experience and better prepare students for professional practice.

As Browne (2010) notes, employment prospects are important to prospective students, and will influence course viability. This work examines means by which course provision, and potentially student employment prospects, can be enhanced through authentic assessment and allied feedback. Enhancing the use of authentic assessment to strengthen links between built environment undergraduate courses and industry practice would better support students learning, helping them to bridge the theory – practice disconnect and promoting their development as practitioners. Issues around these are discussed in this chapter.

In summary, a disconnection has been identified between the courses under investigation and employment in professional practice for which these courses are aiming to prepare students. This disconnection was evident in the design of assessment, some of which lacked authenticity to professional practice and in assessment feedback, which often made little or no reference to professional practice activities. Further, students held a perception that most relevant learning occurs in the workplace rather than through their university studies, and conversely that their studies were only loosely related to professional practice. Similarly, employers assumed, although possibly did not desire, that students would learn 'on the job', whilst viewing a degree as an academic qualification and a route for the individual towards achieving chartered status.

Arguably, learning has become a product with an assumption that it can be packaged to meet customers' needs (Olaniran and Agnello, 2008). In higher education the consumer is primarily the student (Mark, 2013) although there are a number of other key stakeholders, in particular universities, the professions and employers (Trede and Smith, 2012). Supplying a learning experience which meets these stakeholders' needs is imperative. Yet there remains a tension in higher education, the need to retain academic credibility, which in part at least derives from pursuit of Mode 1 prestige knowledge rather than Mode 2 knowledge (Chapter 2) of practice-based courses and which in the

traditional university model of knowledge could be regarded as being inferior. This work regarding built environment students learning experience is timely because of the increasing financial pressures which universities find themselves under. Being able to offer an enhanced experience and so better preparing students for professional practice is a goal of this research and enables the Department to compete more effectively than otherwise would be the case.

The central message of this chapter is that authentic assessment and allied assessment feedback may offer scope to enhance the built environment undergraduate learning experience, developing students' practice-based knowledge and skills, and thereby better meeting their learning needs and those of industry. This work does not suggest that all assessment should be authentic to professional practice, and indeed has acknowledged the need for traditional assessment such as formal written examinations as a complement to authentic assessment (Chapter 2, Section 2.3). Findings of this work suggest that there is potential to enhance students' learning experience in the Department through aligning authentic assessment and assessment feedback with professional practice for built environment undergraduates. The modifications to assessment in the action research suggested that authentic assessment was effective in providing an improved learning experience which provided students with insight into the real world and the world of professional practice.

9.2.2 Relevance of assessment and learning

This research has revealed that authentic assessment was valued by students as they recognised its relevance for their own personal professional development and learning (Chapter 6). Students' perceived authentic assessment as relevant and as offering preparation for industry. '*I've used that skill in the real world*' (built environment student, focus group J). Authentic assessment made it clear for students that their assessment helped them to develop their real-world knowledge and skills. This matches findings of Teagle, et al., (2017), that authentic learning activities which expose students to tasks practitioners encounter was perceived positively by students and considered an effective learning experience to prepare them for professional practice.

Conversely, in this study students perceived inauthentic assessment as of limited application. For example, *There wasn't really a lot about CDM or general up-to-date regulations that you'd actually use, it was just really generic like roles and responsibilities* (built environment student, focus group J). Inauthentic assessment did not provide a

real-world anchor for students around which meaningful learning could focus and was not perceived by them as valuable or which they would use. Arguably, if students perceived their learning and assessment as inauthentic to the real world or as irrelevant, this provided an obstacle to learning, requiring them to undertake assessment activities which had limited practical value other than passing their course. As such, inauthentic assessment may have discouraged students from taking a deep approach to their learning. This also meant that students may have had to make their own connections between theory and professional practice activities as the assessment did not make this transparent; inauthentic assessment did not help students to make this link. Further, "learners interact with assessment based on their understanding of its purpose" (Watling and Ginsburg, 2018, p.4), which suggests that inauthentic assessment presents students with a bewildering challenge; they have to complete assessment where the practice-based purpose is opaque. Inauthentic assessment activities are not directly applicable to professional practice and the development of students' employability skills remains neglected as inauthentic assessment does not elucidate their purpose and application. Students recognised assessment which was inauthentic and its purpose for them became purely a means to an end – achievement of their award. The value of assessment for learning in terms of preparing students for industry was diminished.

9.2.3 Deep learning was stimulated

Authentic assessment encouraged students to take a deep approach to their learning and this was evident, for example, in their application of knowledge through authentic assessment challenges (Chapter 6, Section 6.4). This aligns with findings of Adapa (2015), that authentic assessment facilitates deeper engagement with the subject. Challenges of authentic assessment required students to engage with their academic studies in ways that inauthentic did not; they had to engage with the assessment challenge in order to construct a product or undertake an activity which demonstrated their understanding of the subject.

In a sense, authentic assessment offered a Vygotskyan approach to students' learning and development; it provided an experience which was challenging but was within students grasp to complete effectively (Abrams and Gerber, 2013). Students reported an increased degree of challenge with authentic assessment '*you have to think very quickly*' (built environment student, focus group H) which did not emerge from inauthentic assessment. Nevertheless, students completed the authentic assessment effectively, with an improved mean mark compared with previous years (Chapter 6, Table 6.2). This

suggests that authentic assessment can push students to higher levels of thinking and performance, and so to achieve higher levels of attainment in Bloom's learning domains.

9.2.4 Repositioning the student as practitioner-in-waiting

Within the setting of an HE environment students construct their social role and "sense of self" (Kaufman, 2014, p.37). However, as has been noted elsewhere, on practice-based courses students may still learn to be students rather than industry professionals (Dannels, 2000, p.33); repositioning students as practitioners-in-waiting supports their learning and nudges them towards becoming practitioners, adding synergy to the learning experience. Interestingly, constructively aligning assessment and assessment feedback with professional practice helped to reposition students as practitioners-in-waiting (Chapter 6 Section 6.5). This is an important point because whether students are positioned as students or as professionals has consequences for the creation of students' identity (Daniels and Brooker, 2014) and impinges on their learning experience. This was particularly evident for optometry students, and the causes of this were two-fold, as follows.

- First, the setting for optometry practice-based assessment activities was the university clinic, and while there students were explicitly required to dress and to behave as practitioners. In other words, space with its "social meaning" (Usher, 2015, p.1007) was a tool in the development of optometry students as practitioners. It is known that environment plays a role in the construction of professional identity (Bayerl, Horton and Jacobs, 2018). For built environment students the professional setting was, by necessity, only sometimes recreated in the classroom, for example use of the architecture studio or law court. However, there was no requirement for built environment students' to dress or to behave as practitioners except during those occasions when they undertook practice-based assessment and then it was a recommendation rather than a requirement. Norms of professional dress and behaviour were largely neglected as being able to contribute to students' development as practitioners. Yet behavioural group norms can have profound consequences on the individual's behaviour (Pedersen, Neighbors and Labrie, 2010). This, therefore, suggests that setting by necessity was little used, and that preparing students through norms of expected behaviour was seldom used to prepare students for industry. Potentially, unlike the optometry students, for some built environment students – particularly the full-time students - starting employment in industry would in all likelihood be their first

experience as a practitioner; it is probable that they would be less well prepared than could otherwise be the case.

- Second, when optometry students' were in the clinic they frequently engaged in two-way feedback dialogue with skills tutors to evaluate the merits of different possible solutions to patient vision problems or appropriate tests to conduct. Engaging with practitioners more as equals than as students was an important step in students' personal professional development. Participation has been found to have a positive influence on students' professional self-identity development (Vivekananda-Schmidt, Crossley and Murdoch-Eaton, 2015) and social interaction is important for development of students' identity (Marjatta, Puukari and Kouvo, 2013). More than this, optometry students were learning through behaving as a practitioner; they had become a practitioner-in-waiting. For built environment students, assessment feedback activities which incorporated engagement with a practitioner were rare (Chapter 5 and Chapter 7) and seldom included discussing solutions to practice-based problems. The creation of interaction focused on practice-based activities in an authentic setting offers scope to enhance the learning experience. In the action research, engagement with a practitioner was embedded within modified assessment and was valued by students. This proved effective in improving students' marks, although their evaluation of the module was more favourable than in the previous year but not as good as earlier.

Professional self-identity is bound up with "students' self-perception and their perception of the professional role" (Vivekananda-Schmidt, Crossley and Murdoch-Eaton, 2015, p.1534), which suggests that actively engaging students in a professional role in a professional setting enhances the learning experience. Optometry students were positioned as practitioners in a professional setting and engaged with practitioners. Norms of behaviour and engaging with practitioners in assessment activities are areas which could be further exploited to support built environment students learning and development. Such dialogue with practitioner can also help students to link theory with practice, and to integrate their Mode 1 and Mode 2 knowledge and skills.

9.2.5 Students as oven-ready practitioners

Research has shown that built environment graduates often have insufficient competency development or preparedness for professional practice (Poon, 2012; Witt, et

al., 2013). Quarterman (2017) noted that surveying graduates lack sufficient professional competencies to be effective in the workplace. When authentic assessment was introduced in this research, it helped to prepare students as 'oven-ready' practitioners by providing assessment challenges from which students were able to learn from experience and were, therefore, better positioned to apply their learning in industry (Chapter 6). This was similar to findings of Pierce, Petersen and Meadows (2011) that authentic assessment helped students develop their practice-based knowledge and efficacy as practitioners, and Raymond, et al. (2013) who found that students held a perception of authentic assessment as developing their knowledge and skills for professional practice. At the pedagogic level, authentic assessment provided an enhanced learning experience, and improved students' preparation for professional practice through their experience undertaking real world activities or engaging with the real world in some way. Preparing students as 'oven-ready' practitioners through authentic assessment and feedback supports students' development through their exposure to practice-based real-world activities and challenges, thereby better equipping them for industry. This highlights the importance of using authentic assessment; it provides an enhanced learning experience which may help to prepare students for industry more effectively than otherwise. This finding also is attributable to earlier findings, which when combined synergistically support students development as oven-ready practitioners.

9.2.6 Linking theory and practice

Authentic assessment was perceived by students as valuable because it helped them to link theory and practice, and to overcome their perception of a gap between these (Chapter 6). Built environment students also relied on their tutors to help them link theory with practice, "[tutor] *does do that quite well*" (built environment student, focus group J). Evidence from the optometry course showed that authentic assessment helped students to link theory and practice through the assessment activities they undertook which linked with the theory they had covered in class (Chapter 6, Section 6.5.7). This was similar to findings of Swanson (2011) that students profit from undertaking real-world practice-based activities which can help them bridge the theory-practice gap and enhance their learning. The real world dimension of authentic assessment helped students in this study to contextualise their learning, and to understand the rationale and need for that knowledge. This helped students to appreciate the interconnections of their studies, rather than viewing university and professional practice as being separate entities.

In other words, authentic assessment and allied feedback served as a glue that helped to integrate theory and practice within the learning experience, enhancing the relevance of formal learning for students. The importance of an integrated higher education experience has been recognised (Ashwin, 2014) and this work identifies routes to enhance this for built environment students through use of authentic assessment. Findings of this research support the case put forward by Dee Fink (2013), who argued that designing an integrated learning experience is valuable; delivering an integrated learning experience is vital and, therefore, should be incorporated within assessment and feedback design.

9.2.7 Avoiding 'drift'

Authentic assessment helped to reduce the 'drift' that evolved in the process from PSRB documents to design of assessment and assessment feedback (Chapter 5 and Chapter 7) by refocusing assessment on professional practice activities. The GOC PSRB documents were highly prescriptive whereas built environment PSRB documents gave varying degrees of leeway to HEIs. For example, the GOC required optometry students to successfully conduct a prescribed number of eye examinations on specific categories of patient, the goal of which was to ensure students were effective practitioners. However, for built environment tutors, PSRB requirements often gave considerable latitude in respect of assessment design. Consequently, a range of assessment was produced, some of which was authentic although some was not - as one student observed "*fantasy projects*" (built environment student, focus group D). This meant that students sometimes undertook assessment activities which were not a simulation of practitioner activities - there had been a movement away from real-world practice-based towards assessment which was not grounded in reality. This is not to suggest that all assessment should reflect professional practice activities. It is important that some assessments test students understanding of theoretical Mode 1 knowledge as this is necessary for effective practitioners. However, this research revealed that authentic assessment provides a focus that resonates with PSRB documents and ILOs while supporting students' development as practitioners. The authentic assessment helped to realign the learning experience, to juxtapose formal Mode 1 learning with Mode 2 professional practice activities.

HEIs and tutors in the Department are acutely aware that to remain viable built environment courses require accreditation. In turn, PSRBs have a major influence as regards curriculum content (Poon, Hoxley and Fuchs, 2011). This work identifies gaps

between tutors and students' perspectives regarding how students' learning is assessed, noting that inauthentic assessment can meet PSRB requirements and module ILOs but not meet students learning needs as well as is desirable. Inauthentic assessment places students in a vacuum, undertaking assessment activities which are not authentic to the work of industry practitioners but which consider real world activities. Consequently, these assessments do not clearly develop students' knowledge and skills as practitioners, yet students must complete them effectively in order to pass their course. It was interesting to note that small changes in assessment design had positive outcomes, for example in the change of assessment in the economics module (Chapter 6, Section 6.4).

9.2.8 Feedback and reflection

Students perceived feedback as a device to help them improve their work and in particular to help secure improved marks. As a result students tended to engage with feedback only where they identified a need to improve. For example, "*if you get high grades, you're not necessarily gonna be concerned about feedback*" (built environment student, focus group G). This suggests that students viewed feedback as relevant to individual modules which they perceived as separate silos of learning and as having limited application for their professional development (Chapter 7). In other words, assessment feedback was not perceived as a learning device but as integral to realising performance goals of assessment, a fixed point to be reached in order to secure high marks. As Watling and Ginsburg (2018) note, it is valuable on professional courses to create a culture of focus on improvement rather than on achieving fixed performance goals; feedback should be integral to achievement of continuous improvement. This links with the need for practitioners to exercise reflection (Schön, 1983); encouraging students to perceive learning as a continuing experience and to develop the attribute of reflection and further improvement adds to their professional development and preparation for industry. Feedback should be a starting point to develop this attribute. However, findings of this research revealed that, at best, students participating in this research made only limited use of feedback for their own personal professional development. They tended to perceive feedback as information to help them produce the 'right' answer. Other research has similarly found that students did not make sufficient use of feedback for learning; students with higher marks used feedback as confirmation of their relative position and to build their confidence (Harrison, et al., 2013) and weaker students made limited use of feedback. Enabling students to understand feedback as a device for learning rather than as a source of information to improve their mark would support their

development more effectively than currently is the case. Helping them to understand the need for reflection and continuous improvement as integral to their use of feedback would help their development. Therefore, reflection should be built into assessment feedback to encourage students to undertake this important activity.

9.2.9 Feedback and assessment design

To an extent feedback design was shaped by assessment design, and that authentic assessment was more likely to provoke feedback that alluded to practice-based activities. In the dissertation module from all courses in this study feedback was similar, with a theoretical academic focus. '*You have not presented this Harvard Style*' (feedback on a construction course module) was a common academically focused comment which did not help students appreciate its value for their professional development. This aligned with students' perception that they did not always understand feedback comments, including feedback on referencing. However, feedback is important for learning (Eraut, 2004) meaning that their limited understanding of feedback represents a missed opportunity to enhance the learning experience.

Authentic assessment provoked feedback which alluded to professional practice activities. '*Your first letter to the client has provided a useful overview as to how the contract would operate*' (feedback on a surveying module). Such feedback was stimulated from the practice-focused design of assessment and allowed students to appreciate the real-world application of their work, and efficacy as practitioners. As feedback is important to help students learning up to and beyond graduation (Evans, 2013) then feedback on authentic assessment has particular significance as it opens the possibility of developing students as practitioners as well as supporting their academic development. Further, it could be used as a device to enhance the students' development of their skills as reflective practitioners, which is important. Assessment which links with the real world is valuable (Ashford-Rowe, Herrington and Brown, 2014) and this research develops that work, suggesting that feedback should be embedded as a complement to authentic assessment and used to encourage students develop knowledge and skills in preparation for professional practice.

9.3 Evaluation of the research methods

The action research (Chapter 3) sought to modify assessment and assessment feedback practice within the Department. Data were gathered for this research, including Stage

One, during the academic years 2014/15, 2015/16, 2016/17 and 2017/18 and the outcome of modifications to practice were analysed. An overview of the action research is as follows. First in 2014/15 identify the problem and then in 2015/16 establish the *status quo* in the Department and in the comparative case studies in respect of the issues under investigation. Identify routes to modify practice. Next, in 2016/17, implement modifications to practice and then evaluate the impact of modifications made. Final data was collected in 2017/18.

The object of the action research was to identify assessment and feedback practice within the Department, then to modify practice and evaluate the interventions made. Comparative case studies were used to inform changes to practice of the action research. In particular, the comparative case studies proved helpful in highlighting cultural differences (Mullins and Christy, 2016) on courses preparing students for professional practice, as well as highlighting practical differences and specific problems facing built environment tutors. These differences might have remained unnoticed without the comparative case studies to generate ideas for the action research; it was providing contrast with the Department which was valuable. Four devices were used to achieve the action research goal, as follows: two meetings with Department tutors to discuss and promote authentic assessment were held; two Department Development Days were produced; third, frequent verbal reminders to tutors regarding authentic assessment and feedback were given; and, fourth, changes to the researcher's own practice were made.

Optometry courses more than forensic science proved valuable in providing a sharp contrast with the Department in respect of assessment and assessment feedback. Of note was the optometry course focus on real-world assessment activities and students' engagement with practitioners more as equals than as students. The comparative case studies also highlighted some of the difficulties creating authentic assessment on built environment courses. These arise from the nature of work that has to be undertaken, timescales involved, and the nature of professional relationships which in the built environment can be adversarial (Aminian, 2014).

The researcher's own academic discipline, economics, is a contextual subject rather than practice-based. Designing authentic assessment was challenging in the researcher's own subject, which was perceived by building surveying students as being of limited relevance (Hoxley, 2012), and which, anecdotally, was a perception of some students in the Department. It would have been helpful to be involved with a practice-

based subject having potential to design a practice-based authentic assessment. However, there were two advantages to the researcher's position. First, it provided a more distant view of authentic assessment in built environment practice-based modules than would otherwise have been the case. Cohen, Manion and Morrison (2018) note that the separation of the researcher from the activities being undertaken can never be value free, and so must be taken into account. Second, it meant that in order to design authentic assessment the researcher had to reflect on what was meant by authentic assessment on built environment courses and also how it could be achieved so far as possible in a theoretically-based module.

As integral to the action research, the researcher made revisions to her own assessment practice. The modified assessment was well received by students, produced valuable data and established that a contextual module could contain and be enhanced by authentic assessment. It gave legitimacy as an agent for change that the researcher was able to use her position as Department Learning Lead in order to promote authentic assessment. Being an insider in action research raises the difficulty of persuading participants to revise their own activities (Bell and Waters, 2018). Teaching contextual subjects and lacking practice-based built environment experience made the researcher in some respects an outsider to the Department, being an 'insider' and an 'outsider' simultaneously. An insider in the sense of being a tutor in the Department, and an outsider in respect of professional practice knowledge activities. This gave a degree of detachment which helped a dispassionate perspective to be taken. Persuading tutors to assimilate the concept of authentic assessment and to integrate it within their own assessment was a challenge that was only partially overcome. A small number of tutors did recognise the value of authentic assessment. However, some did not, and only one tutor in addition to the researcher modified their assessment practice, although some tutors already designed authentic assessment. This provided unexpected and useful data. It emerged that tutors professional practice experience correlated with their design of authentic assessment. This lent support to the findings and to the conceptual conclusion; each tutors own epistemological position shaped their perception of what constituted appropriate assessment design.

There were some obstacles to overcome during the course of this research. There was the challenge of securing sufficient built environment student participants for the focus groups. This was overcome for focus groups which were held at lunch time by providing refreshments so that the students were accommodated and also by meeting students at the start or end of their class as this was a convenient time for them.

It could have been helpful to have additional cycles of action research. However, it is recognised that a limitation of action research is that the timescales involved can be long (Gray, 2014) as they were by necessity in this study. Therefore, although further cycles might have been interesting, valuable data emerged from the changes to practice that were made and provided ample data for this study. Despite the challenges which arose during the course of undertaking this DProf, changes to practice were made and will continue after the research has ended.

In summary, lessons from the action research are as follows. During the course of the action research in order to improve data gathering, for example using supplementary questions asked in focus groups and interviews. Conducting interviews and focus groups proved a learning curve for the researcher, and was integral to the process of becoming a researcher. The use of ‘crib notes’ to act as a prompt for the researcher proved helpful, as was the need to exercise sensitivity to participants needs. It was also important to look back as the research unfolded and evaluate what had been achieved (Burns, 2007). This opportunity for reflection is an exciting aspect of action research, and which proved very useful. It is also worth remembering that the researcher was part of the interview and focus group dialogues, and so it must be recognised that her presence as a tutor cannot be separated from the interaction of those events. The researcher was aware also that the process of analysing data was an interpretive process which required judgement, but as King and Horrocks (2010) note, ‘facts’ are open to interpretation. Use of follow up focus groups and engagement with the wider academic community through production of peer reviewed conference papers helped to give validity to the research.

It proved a challenge that the Department as a whole was used rather than only one course, as each course area had its own ethos. However, given the complex interlinking of courses this was a practical route to take. It was appropriate to use the whole Department for this study because this gave a clear over-view of the problem and potential solutions, and these solutions were relevant to all courses in the Department. This, therefore, facilitated the design of the toolkit for built environment assessment and assessment feedback.

9.4 Toolkit for built environment assessment and assessment feedback

9.4.1 The rationale for this toolkit and its purpose

This work has been concerned to respond to the need to enhance assessment and assessment feedback for built environment undergraduates' to improve their learning experience. It is intended tutors should draw from elements of this toolkit to support design of authentic assessment and assessment feedback. It is also intended that students would engage with the actions identified in the toolkit with the goal of enhancing their learning and development. Authentic assessment should be embedded within module assessment, irrespective of whether it is practice-based or theoretical, in order to enhance the learning experience. The goal of this toolkit is to help focus assessment and feedback on professional practice in order to provide students with an enhanced learning experience and to support their development for professional practice. This should also stimulate students to undertake deep learning and thereby achieve improved academic results.

9.4.2 The toolkit

This section contains the toolkit for authentic assessment and feedback (Table 9.1; Table 9.2; Table 9.3; Table 9.4). This toolkit is arranged around the last research sub-questions in order to address each question. There is a narrative for each element of the toolkit.

Table 9.1 How is professional practice included in courses?

Tool	Rationale
Professional practice activities should be a clearly identified component of all built environment course design.	External examiners review assessment briefs and briefs are included in course validation documentation to ensure 'quality'. However, findings established that although courses are designed around PSRB requirements, this is sometimes lost in assessment design which can be synthetic rather than authentic. Therefore, it is important that authenticity to the real world is explicit in course documentation in order to act as a prompt for tutors when designing assessment. Assessment should be clearly based around professional activities, where possible including simulation of real world activity in order to support students' preparation for industry.

Table 9.2 How can professional practice be made explicit in assessment?

Tool	Rationale
Assessment should, where possible, require students to undertake real-world activity which replicates activity undertaken in industry by practitioners.	Findings of this work established that students valued real world activities and disliked scenarios which were not from the real world, perceiving these as unconvincing. Consequently, it is important that assessment contains a real-world dimension. The purpose of this is to allow students to engage with the real world and thereby develop their knowledge and skills in readiness for professional practice. In short, to 'learn by doing' via task-focused real-world assessments.
Use authentic assessment activities to help reposition students as	Findings revealed that built environment students were positioned as students more than as practitioners during their learning. However, it is valuable to help students perceive themselves as practitioners rather than as students and so develop their professional practice confidence. The purpose of this repositioning is to develop students' self-identity as

practitioner-in-waiting.	professionals and so stimulate a shift in their learning behaviour, including their development as a reflective practitioner.
Use of contemporary real-world resources with which students should actively engage as integral to their assessment.	The action research identified the value of using real-world resources as integral to authentic assessment and this was perceived favourably by students. It was noted that these resources did not necessarily have to be those used by practitioners but the real-world dimension was important. The object of this would be to require students to use, so far as possible, real-world materials and thereby gain experience of and familiarity with authentic materials which are used in the real world.
Use real-time activities for students to undertake their assessed work.	It was noted that real-time was a constraint within which optometry students operated and for built environment students was often artificial in assessment. This suggests the need for dimensions of real-time to be incorporated into assessment. This would provide students with an experience of the time-pressure that exists in professional practice, particularly in industries such as those in the built environment where clients' needs have to be met within specified timescales which can sometimes be testing. Assessment activities conducted in real-time also provide students with insight into the challenges of the real world which are set in the context of time as a boundary.

Use of a practitioner in assessment which requires students to actively engage with that practitioner.	Findings suggested that students recognised the real-world challenges that arise in professional practice when engaging with practitioners, for example practitioners acting as potential clients. Consequently, use of a practitioner in assessment activities to support students learning and development is suggested. The purpose of this is to develop the real-world authenticity of the learning experience and so help students develop professional practice knowledge and skills in each of Bloom's domains. This should also contribute to students' development as practitioners-in-waiting.
Revise the Department assessment review protocol to include a check for authenticity of assessment.	This work has established that some assessment lacks authenticity to professional practice, yet including authenticity enhances the student learning experience. Consequently, modifying Department protocol in this respect would strengthen student experiences through the re-focusing of assessment. The purpose of this revision to Department protocol in this way is to embed professional practice into assessment throughout the Department. This would contribute to the cultural repositioning and refocusing of Department assessment. This is now undertaken in the surveying area of the Department.
The Department should provide	Findings of this work revealed that students tended to perceive their course as composed of silos of learning contained in separate modules. Consequently, helping students

a comprehensive 'skills guide' for each course which is provided to and used by students and tutors.	understand how their course is an integrated learning experience supports their academic and professional progress, helping them to appreciate the connections between the subjects they study. The purpose of this guide is to provide information for students and tutors regarding skills and competencies being developed in each module and through each course. This to help students appreciate the integrated nature of their course at the outset of their studies, showing how professional practice knowledge and skills integrate through their course. Further, the guide would contain information to support development of students' assessment literacy and help them to link course content and module ILOs with professional practice. This would enable students to understand the value of their learning for their personal professional development.
To create a cultural change, the Department should produce development activities for authentic assessment.	This would be a long-term goal. It was clear from the data that tutors held the view that their assessment was authentic whereas students often did not share this perception. This led to the need for tutors to be made aware of students' perceptions, the value which students attached to authentic assessment and what they perceived authentic assessment to contain. The purpose of this element of the toolkit is to strengthen the authenticity of assessment provided in the Department. Tutors should also be reminded and encouraged to take a constructivist approach to assessment, to view assessment as assessment *for* learning rather than assessment *of* learning (Sambell, McDowell and Montgomery, 2013) and to do so in the context of authentic assessment. At the time of writing, a course design

	initiative, reviewing each course, has convened once for course leaders on 30 April 2019 and subsequently for each course area on 9 May 2019 and 20 May 2019 with all course tutors being involved in these latter two meetings, and these included addressing increased use of authentic assessment.

Table 9.3 How can feedback on assessment be designed and used to reinforce learning in the context of professional practice?

Tool	Rationale
The Department should design and implement the use of a template for feedback which incorporates practice-based knowledge and skills, and this should be used in each module.	It was noted that feedback was highly variable in quantity and in form. This led to the recognition that a degree of standardisation could ensure that key aspects of feedback were embedded within all written feedback for students in the Department. The purpose of this is to provide a more consistent approach to written feedback including reference to Mode 1 and Mode 2 knowledge, helping students to appreciate how their learning integrates with professional practice, and including where possible reference to their efficacy as practitioner and/or development of their employability skills. The purpose of this would be to help students to focus on their academic and professional development.
Provide generic feedback with an accompanying explanation for all students at	It was noted that certain feedback comments appeared in a number of modules yet students did not always understand these comments and further did not know how they should be implemented. However, providing generic feedback with an explanation would benefit students by allowing them to understand feedback comments and appreciate how to respond to them. Accordingly, the purpose of this element of the toolkit is to provide students with information regarding frequently occurring feedback and help students

the start of the course.	understand what their response to such feedback should comprise. It also offers students information to avoid making common errors.
Assessment criteria should include reference to the real world or professional practice activities.	The influence of assessment criteria and yet the absence of reference to professional practice suggested that this was an unused avenue to press students towards their development as a practitioner. Consequently it is important that consideration is given to assessment criteria and the influence they exert over the assessment process. The purpose of this tool is to re-direct students' attention and tutors' feedback towards industry, with the goal of enhancing students' development for professional practice. This is now encouraged in the surveying area through the internal assessment review process and encouraged in other built environment course areas.
Students should be provided with guidance to help them understand how to use their assessment feedback.	Evidence from the focus groups identified that students did not always understand their feedback or know how to implement it. Consequently, feedback is an under-used resource which could be deployed to add value to students learning and development. This led to the need for students to receive guidance to help them understand the meaning of feedback, how to use feedback and to appreciate its value for learning in order to provide purpose to using feedback. The goal of providing such guidance is to help students appreciate how best to use feedback to enhance their learning experience and to help students take their summative feedback from each module to their subsequent learning.

	This is provided in the FdSc Surveying course handbook.
Students should be provided with a facility to record and consolidate feedback throughout their studies, in addition to providing support to be able to use this effectively.	Findings suggest that students do not take feedback from one module to subsequent learning. This means that they are not using summative feedback formatively and also they do not have a single record or overview of feedback regarding their work. Keeping a feedback log would allow students to have a record of their feedback and the themes which emerged. This would allow them to see those areas where they were consistently weak and so address them. They would also be able to note areas of strength and continue to make use of such strengths. This would require students to engage in self-regulation and reflection in order to realise the value of such a facility, and support for students to help them understand how to do this should be provided. This is provided in the FdSc Course hand book, and encouraged in other built environment course areas.

Embedding feedback dialogue as integral to learning would ensure students engaged with their feedback.	This work found that students often perceived feedback as information to help them improve their work but rarely saw feedback as two-way dialogue for learning, sometimes perceiving feedback in an adversarial light. This led to a recognition that the dialogue dimension of built environment courses could be enhanced to improve the learning experience. Embedding feedback dialogue would help students to be active learners, engaging with their tutors regarding their assessment activities, and, further, could also contribute to repositioning the student as a practitioner-in-waiting.

Table 9.4 How can students gain the most value from feedback on assessment in relation to their personal professional practice?

Tool	Rationale
Students should be encouraged to ask questions regarding any aspects of their feedback which they do not understand.	Student focus groups revealed that students do not always understand their feedback. Consequently, students are left frustrated yet uncertain as to how they should proceed. The purpose of encouraging students to ask such questions is two-fold; to help students understand all of their feedback, and, to further develop the dialogue dimension of feedback. If students ask questions on feedback regarding authentic assessment this also contributes to the re-positioning of students as engaged practitioners and opens the door to two-way debate with tutors regarding the students work. This should be designed into each course, for example in tutorials, and become part of the course norms as students' progress though the modules on their course.

Students should be encouraged to engage with feedback in the context of their professional practice during and beyond the formal learning phase of each module they study.	Findings of this work noted that students did not take their feedback forward to subsequent learning. This means that students are not realising the full value of their feedback. Therefore, the purpose of this is to help students use their feedback in subsequent learning by providing guidance as to how it should be done. This would help students to link their formal learning with professional practice. This links with the reflective log students should keep.

9.5 Conclusions of this chapter

This chapter has discussed the findings of this work. It must be emphasized that the findings suggest the value of authentic assessment and allied feedback to give professional relevance to courses in the Department. Authentic assessment also helps address the disconnection that was found between the student experience and professional practice. These are important points because the research suggests authentic assessment helps students to prepare for employment in practice, it enhances their learning experience, strengthening theory - practice links.

Authentic assessment provided a learning experience that students evaluated as effective and challenging, offering them enhanced insight into the professional world and promoting deep learning. Authentic assessment helped to address the disconnection that students perceived between their academic study and the world of work. Bridging the academic – practice disconnection identified in this study improved undergraduates' perceptions of their learning experience, supporting development of their knowledge and skills to better meet employers' needs.

This study contributes to academic debate regarding assessment and assessment feedback for built environment students in particular. Research has shown that assessment is a powerful driver of student learning activities (Deneen and Boud, 2014) and that employers consider graduates as insufficiently well prepared for professional practice (Poon, 2012). This work seeks to encourage use of authentic assessment and allied feedback as it offers potential to better meet employers' needs for graduates' with appropriate skills by directing students learning to practice-based or real world activities and/or learning. Given that some built environment assessment in the Department is inauthentic, and perceived as being of limited value by students, this suggests that there are gaps in students' learning experience and opportunities which are not fully exploited.

These findings are relevant to tutors in the Department, providing insight to authentic assessment and allied feedback to underpin students' learning and development for professional practice. Findings of this work should also be of interest to tutors on similar undergraduate built environment courses and tutors on accredited courses which prepare students for professional practice.

Chapter 10 Conclusions, Recommendations and Reflection

10.1 Introduction and purpose of this chapter

Undertaking this research was prompted by students' evaluations in the NSS of feedback in their course; it subsequently emerged that the problem was bound with assessment as well as in assessment feedback. Chapter one set the scene for this work, identifying the problem under investigation, the context within which it sits and providing a summary of the thesis. The investigation centred on interlinked problems concerning assessment and assessment feedback on built environment undergraduate courses in the Department. The following chapter provided theoretical perspectives of the areas central to this research.. Next, chapters three contained the research design, methodology and methods, which were taken from an anti-positivist and interpretive stance, and used comparative case studies to help inform action research to support modifications and improvement to practice in the Department. Chapter four provided information of the action research including the researcher's thought processes as the work progressed and how this influenced the introduction of modification to practice. Chapters' five to eight inclusive provided findings in relation to each of the research sub-questions, each chapter addressing one sub-question. The chapters discussed the findings, identifying themes from the data and the outcomes of the action research. Chapter nine contained a further discussion of these findings in the context of the central research question and sub-questions. The chapter then went on to provide an evaluation of the research process and a toolkit for tutors which was developed from the key findings of this work.

The purpose of this tenth and final chapter is to draw together the findings of this research, which as a DProf is concerned to resolve a specific problem in one setting. Following this introduction, there is a synopsis of this thesis followed by the conclusions in relation to each of the research sub-questions and the central research question. Next is the contribution to knowledge for theory and practice followed by recommendations for practice and for further research, as this research has only begun to 'scratch the surface' of this topic. Next are the limitations of this

study, as it is important that these are made clear for the reader. Finally there is the researcher's reflection on her doctoral journey through the production of this thesis.

10.2 Synopsis of this thesis

The trigger for this research was built environment students' evaluation of their assessment feedback as being the weakest part of their learning experience. As feedback is important for effective learning this presented a serious problem, particularly as built environment courses seek to prepare students for professional practice. Findings of preliminary research undertaken in Stage One of this DProf established from a sample of marked work that there was no reference to professional practice in assessment feedback. The sample size for that study was small and so findings should be treated with caution; nevertheless it was an unexpected finding and worthy of investigation. Subsequently, it emerged that assessment design was also implicated, as authenticity to professional practice was often absent from assessment design. Given the practice-based nature of the courses under examination, and the fact that all but one of the courses were accredited, this potentially represented a serious weakness in course provision. Further, literature revealed a number of problems. Across the sector it was recognised that built environment courses did not always develop students' employability skills as well as desirable (Hampton, 2016). Employers expressed concern that real estate graduates did not possess sufficient commercial awareness and that their 'soft skills' were weak (Poon, 2012). The needs of industry were not always sufficiently well met (Owusu-Manu, et al., 2014). This lack of graduate preparedness for industry suggested fundamental weakness in the Department's provision, and one which was, it seemed, replicated elsewhere.

From this initial situation, it was clear that there were issues germane to this work, as follows:

1. In summary, the central goal of undergraduate courses in the Department is to support students' learning and development, preparing them as professional practitioners for employment in the built environment.
2. Students' formal learning converges around the assessment activities which they undertake.

3. Undergraduates in the Department are expected to acquire and demonstrate both Mode 1 and Mode 2 knowledge in their assessed work.
4. Assessment is the means by which student learning is evaluated in higher education.
5. The goal of assessment feedback is to support students' learning and development in order to help improve their performance.
6. The central themes were learning, knowledge, assessment, assessment feedback and professional practice.

The central research question and four operational sub-questions provided the scaffold of enquiry for this research. Around these, the research design was constructed, methodological approach detailed, data gathered including modification to practice and data were analysed. This work is anti-positive and interpretive, seeking to understand the perspectives of those involved with the built environment undergraduate learning experience in a particular setting. It is acknowledged that anti-positive research, with qualitative data such as that gathered for this research, makes it "difficult to establish and measure cause and effect relationships" (McCann, 2017, p.338). This work recognises that such a difficulty is intrinsic to research such as this, which studies human activities. It must be appreciated that in the interpretive paradigm "knowledge is context-specific and dynamic" (Hepworth and Kay, 2015, p.760). This DProf has been concerned with addressing a specific problem in one particular setting at one time. Such anti-positive interpretive research is valued here and recognised for the positive contribution that it makes to academic debate and knowledge, as well as addressing the problem under examination.

Findings reveal that there were benefits associated with use of authentic assessment. First, student academic results were enhanced, with a higher mean mark and a greater number of students passing assessment at the first attempt (Chapter 6, Table 6.1 and Table 6.2). Second, students valued assessment that helped them to develop their practice-based knowledge and skills which they recognised as having real-world application. Third, students valued being able to use professional practice knowledge gained through their formal learning at university. Fourth, student evaluations of their learning experience were enhanced with authentic assessment in a practice-based module and a theoretically-based module.

This research has established routes to enhance assessment design and assessment feedback for built environment undergraduates in order to improve their learning experience and development as professional practitioners. In summary, these routes are to enrich and extend the use of authentic assessment in order to prepare students for professional practice. This research suggests that as a potential route to better meeting students learning needs, authentic assessment increases “student learning, involvement, time on task, motivation, and self-regulated learning skills” (Litchfield and Dempsey, 2015, p.78). Authentic assessment provides a learning experience which engages students with practice-based activities, providing opportunity to respond to opaque real-world challenges which practitioners’ face and so develop practice-based knowledge and skills. When feedback was aligned with authentic assessment it helped students to prepare for professional practice. These modifications offer enhanced scope to provide for industry graduates who are able to perform more effectively as professional practitioners.

10.3 Conclusions

This research has sought to identify means by which assessment can be made more authentic to professional practice and, allied with assessment feedback, enhance built environment undergraduates’ learning experience. The four sub-questions and central research question are provided below along with the findings for each.

Research sub-question one.

How is professional practice included in courses?

This sub-question was designed for examination of the original issues at the start of producing this thesis. In other words, the goal was to establish existing practice, drawing from key documents that were fundamental to constructing the student learning experience. This research identified that professional practice is embedded within PSRB requirements to varying degrees, and is contained in course design, ILOs and assessment. Course design was clearly intended to develop students’

knowledge of practice and to provide them with an effective theoretical grounding in readiness for industry. The central theme here concerned the authenticity of assessment. Assessment design incorporated the PSRB requirements, for example the use of report-writing as integral to assessment. However, some assessment briefs did not provide authenticity to professional practice. For example, some assessment required activities which were not those undertaken by practitioners. Professional practice was included in courses but it was sometimes manifest in assessment in ways which proved a source of inauthenticity although meeting ILOs. In summary, whilst professional practice is included in courses at each stage of constructing the learning experience, assessment often lacked authenticity to professional practice and this was a gap in the learning experience.

Research sub-question two.

How can professional practice be made explicit in assessment?

This question was designed to understand the means by which tutors could incorporate professional practice activities into assessment design. It would, in the action research, reveal students perception of enhanced authenticity of assessment and means by which this had been achieved. Conclusions in respect of sub-question two are that the use of authentic resources and authentic activities are important to contribute to authentic assessment. The central finding in response to this research sub-question is that assessment should be designed to recreate or draw from professional practice, using real world activities and materials so far as possible.

In some built environment modules assessment design can incorporate professional practice activities. However, it is not possible in all modules to provide assessment that is fully authentic to professional practice activities; some contextual or theoretical disciplines do not reflect practice-based activities but are necessary knowledge for practitioners to acquire. Therefore, in such disciplines the use of authentic resources or other facet of the real world to support students learning and provide context is appropriate in order that professional practice and the real world will be represented in assessment.

Research sub-question three.

How can feedback on assessment be designed and used to reinforce learning in the context of professional practice?

This sub-question is included as the goal of feedback is to support learning, and so feedback should explain clearly those professional practice knowledge and skills which it is intended students develop. The key theme was the need for feedback to relate to practice-based as well as academic issues. Students should be supported to understand employability knowledge and skills that are developing and how these are being developed through assessment feedback. It was also established that feedback dialogue was an under-used resource which should be more widely used in the Department.

Research sub-question four.

How can students gain the most value from feedback on assessment in relation to their personal professional practice?

This sub-question was included because feedback was the trigger for this research, having been evaluated by students as the weakest part of their experience and is a critically important contributor to effective learning. Students should be supported to become assessment literate and feedback literate, to understand how to use feedback and be motived to do so. Students understanding how to gain most value from their feedback is critical to effective learning. The key theme here was that students made limited use of their feedback; they did not always collect it and of those who collected it, they recognised that they did not always use it. To that end, students should be supported to understand the learning value of their feedback and the need to take feedback forward to subsequent academic learning and to their professional practice activities. There is a tension between the usefulness and quality of feedback, and students' capacity to use it effectively.

The four research sub-questions facilitated addressing the central research question. The central research question was as follows.

How can assessment be made more authentic to professional practice and, allied with assessment feedback, enhance built environment undergraduates' learning experience?

The rationale for this question was to facilitate a research programme that would allow examination of these issues and develop solutions to the research problem (Chapter 1). The central finding of this work suggested that authentic assessment, allied with feedback, provides an enhanced learning experience for built environment undergraduates. This experience was perceived by students as effective and it helped to reduce the disconnection students perceived between their course and professional practice activities. It also produced improved results and enhanced student evaluations of their learning experience. In short, the effect was to enhance the student learning experience, bringing greater relevance and currency to the learning experience. In summary, there were several advantages to this authentic assessment, as follows.

- It helped to underpin feedback on students' performance as a practitioner-in-waiting (Chapter 5).
- It helped students to prepare for industry as they undertook assessment activities which simulated professional practice (Chapter 6).
- It allowed students to experience something of the 'hidden' aspects of being a practitioner, for example the tension of giving a presentation to an unknown prospective client (Chapter 6).
- Students' academic results improved (Chapter 6).
- Students had an experience which they evaluated as being more effective than without this authentic assessment (Chapter 6).
- It gave courses enhanced practical relevance and meaning as students undertook assessment activities which simulated the real world or some aspect of it (Chapter 6).
- It helped students to understand and to better link Mode 1 and Mode 2 knowledge, integrating their learning experience, for example applying their theoretical learning to real world events and using real world resources (Chapter 7).
- Students engaged with real world (Chapter 7).

- ❖ It widened students' opportunities to engage with the real world and with practitioners, for example through inclusion of practitioners in assessment (Chapter 7; Chapter 8).
- ❖ Feedback had enhanced value for students when practitioners were involved (Chapter 8).
- ❖ Feedback dialogue on real world activities helped students to use feedback for learning rather than only as a route to improve their mark (Chapter 8).

Actions for tutors and employers were identified in a toolkit. The toolkit is designed to be used by built environment tutors to enhance their pedagogic practice. It can be used to support assessment and feedback practice in theoretically-based and practice-based modules. In summary the actions concerned: tutors modifying assessment and feedback design; students engaging with feedback; Department protocols and culture reflecting the authentic assessment of this work; and, employers being more involved with assessment.

10.4 Contribution to knowledge

10.4.1 Contribution to theory

Findings of this DProf study make a clear contribution to knowledge regarding authentic assessment and assessment feedback for built environment undergraduate courses and contribute to the on-going academic debate regarding student learning and development. In particular, the contribution to knowledge of this research pertains to the field of authentic assessment.

This work has addressed a specific problem which has not, so far as can be ascertained, previously been explored, namely the interlinked problems surrounding assessment and assessment feedback for built environment students (Chapter 1). Findings of this work highlight the value of authentic assessment on built environment courses, including in theoretically–based subjects where the challenge of designing authentic assessment is significant. These findings were validated by a focus group of students from a theoretically-based module with assessment which had enhanced authenticity; all participants in that group evaluated authentic assessment as preferable to inauthentic assessment. This work also identified the

potential of authentic assessment to help resolve the difficulty which built environment students experienced linking theory and practice.

The research integrated Chong, et al., (2016), Bloom (1956), Bloom, Krathwohl, and Masia (1964). The work identified the use of authentic assessment to underpin an integrated learning experience and giving synergy to students learning and development in each of Bloom's domains, thereby potentially better preparing them for industry and enhancing their Mode 1 and Mode 2 knowledge and skills. It recognised the importance of Vygotsky's zone of proximal development, as authentic assessment offers opportunity for students to develop skills required in industry.

Existing thinking regarding what is defined as authentic assessment has been challenged by this work. This work redefines and reconceptualises authentic assessment for theoretically-based built environment undergraduate subjects. The work identifies means by which assessment may be made authentic and that authentic assessment should be regarded as being on a continuum of authenticity, and this suggests that authenticity can be achieved in theoretically-based subjects as well as in practice-based subjects. This reconceptualization of authentic assessment was put into practice in the action research and subsequently evaluated positively by all participants in the follow-up focus group and the MES data indicated students perceived the changes positively.

The continuum of authenticity stretches from assessment such as formal examinations testing memory and knowledge to simulation of a real world practice-based activity which tests knowledge and attributes required of practitioners (Gulikers, Bastiaens and Kirschner, 2004). This continuum is important in built environment courses. It is noted here that in some built environment subjects it can be, at best, difficult to recreate real world activities in assessment because of the nature of the work. Some areas of study, such as economics, while important knowledge for practitioners, are not an activity which practitioners would undertake. This research suggests that it is possible to enhance the authenticity of the work by drawing from the real world. In this research it was including the *Financial Times* in assessment which provided an authentic dimension. It is recognised that such assessment is not authentic in the sense of simulating real world practitioner activity,

but it provides anchorage to the real world for learners. This anchor may help reduce the “theory-practice gap” (Chong, et al., 2016, p.125) and encourage deep learning (James and Casidy, 2018). Authenticity may be enhanced through the nature of the activity replicating the real world activity. For example, a group assessment activity which replicates a real world group activity provides opportunity for learners to experience professional challenges and develop practice-based knowledge and skills from these experiences.

Authentic assessment required students to respond to challenges which contain a degree of uncertainty, for example giving a presentation to an unknown practitioner contributed to the task of assessment as students had to deal with the heightened stress of the unknown. This is similar to Wiggins “ambiguous problems” which challenge students to “take purposeful action to address the problems” (Wiggins, 1989, p.705). These challenges move students from a theory-based learning to engaging with the real world, with all its complexities.

The research provides insight into students’ perceptions and identifies means by which student feedback needs may be met. This is important because, as the NSS identified (Office for Students, 2018) students continue to evaluate assessment and feedback as one of the weakest parts of their learning experience despite the fact that feedback is important for learning.

The research draws together the support for students’ learning which authentic assessment can provide. For tutors on practice-based courses this is important as it provides an enhanced route to construct assessment. Professional practice underpins course and assessment design and authentic assessment offers scope to prepare students for industry, promote deep learning and better meet industry needs.

10.4.2 Contribution to professional practice

In respect of a contribution to professional practice, the work has produced a tutors’ toolkit (Chapter 9) which is specific to the Department, and should be of interest to tutors on other similar courses. This toolkit was designed to respond to the problem which this DProf originally sought to address, that students in the Department

perceived assessment feedback as the weakest part of their learning experience. Integral with this was assessment design, which often had limited authenticity to professional practice. The toolkit addresses these problems with practical suggestions for tutors.

Further, as a consequence of this study the following modifications to Department practice have been implemented.

- As a further pilot study, the course handbook for the forthcoming FdSc Surveying is being modified to help students understand the links between parts of the course and employability skills they are to develop in each module.
- The course handbook for the forthcoming FdSc Surveying is being modified to provide information regarding common feedback comments, what they mean and how students should implement them.
- The Department protocol for the review of assessment has been modified to encourage inclusion of authenticity in assessment and is used in the surveying area (see Chapter 9, Table 9.2 for details of ARU re-structure and implications for the Department).
- The researcher has modified her own assessment design to enhance authenticity to professional practice in her modules, which are all contextual in nature.
- The researcher modified her assessment feedback to enhance the use of dialogue.

10.5 Recommendations

This research intends to have practical value for pedagogic practice and to contribute to the scholarly community. Therefore, recommendations for practice and for further research address each of these areas. These are actions for stakeholders.

10.5.1 Recommendations for practice

The key theme here concerned the goal of reconceptualising assessment and assessment feedback to develop students as professional practitioners, supporting

learning through integration of authentic assessment and allied feedback within the learning experience. For tutors there is a toolkit to support the design of authentic assessment and feedback. This toolkit:

1. should be used to help provide authentic assessment and feedback in order to enhance the learning experience;
2. there should be increased focus on providing formative assessment; and,
3. the toolkit should be used as standard practice across the Department, which would contribute to the development of a culture of using authentic assessment with allied feedback.

Employers should be encouraged to engage more with the Department than they do at present. For example by inviting them to contribute to and engage with learning activities, for example as well as being present for the assessment of students they could give presentations to students concerning industry, their firm, or issues relating to the environment in which they work. Such industry engagement would allow the Department to further integrate academia with the real world, and so would be of benefit to students and industry.

10.5.2 Recommendations for further research

This work is only one part of the academic debate concerning how best to support built environment students' preparation as professional practitioners. This thesis has only been able to start exploring this subject, but it is clear much remains to be done. Further research needs to be undertaken to develop those areas which this work has examined, as follows.

Students are influenced in their assessment activities by the brief they receive and the assessment criteria. More research is needed to explore the influence of assessment criteria and identify means by which it can be designed to support built environment students' development of their knowledge and skills in preparation for industry. Also, the relationship between criteria and brief on these courses would benefit from further research to examine the influence they exert on students learning. It is also appropriate to investigate how students can be encouraged to take account of feedback they have received for future assessment.

Employers wanted students to develop appropriate knowledge and skills at university, although they perceived that in reality these skills were mostly developed in the workplace. There is a need for further work to evaluate the extent to which authentic assessment throughout an entire undergraduate course improves graduates as already prepared and effective practitioners. This would necessitate a longitudinal study, which unfortunately falls outside the duration of this research.

It was unexpected, though perhaps unsurprising, that tutors' epistemological position influenced their assessment design. Research to explore the influence of tutors own epistemological position in more detail is necessary in order to understand such influences on assessment design and consequences for students.

The research could be extended and replicated with postgraduate courses. Currently in the Department there is limited data available regarding the authenticity of assessment on these courses, and regarding students' evaluations of their learning experience in this respect.

10.6 Limitations of this work

Limitations of this research are acknowledged here. This study provides clear insight regarding the use of authentic assessment and allied feedback to better support built environment students' learning experience. It is recognised that this work was undertaken within boundaries - one setting and over a limited period of time. Undertaking action research at other HEIs would have provided further insight into the subject as could a longer time-scale to undertake the research. However, the research was concerned to address a problem in a particular setting. Consequently, it must be recognised that findings are context and setting specific and as such should be treated with caution. Although not generalizable to the wider built environment higher education sector, the findings should be of interest and value to those in similar settings.

The time available in this DProf had the effect of limiting the action research that could be undertaken. This arose by necessity from the annual cycle of course and module delivery. It would have been useful if there had been opportunity for

additional cycles of action research in order to further modify assessment and feedback practice. In some respects action research does not finish – further cycles could always be undertaken, modifications could be made and new events necessitating a response identified.

During the course of this action research study, there were changes to tutors in the Department, which is disruptive to research as it impinges on continuity (Gray, 2014). It is recognised that this is inevitable, especially given the time-frame over which the study was undertaken and is part of the real-world nature of action research. It is not possible to change this, and it must be regarded as integral to research undertaken in the real world.

10.7 The researcher's reflection on her doctoral journey

Undertaking this DProf has been an interesting experience and challenge. The iterative nature of research and development of new skills required practice, patience and precision has been a challenging but fruitful experience. I was challenged to assimilate new skills and develop new ways of thinking, including writing critically, being able to develop an argument, and gather and analyse data. Each of these were a necessary part of my journey, of becoming a researcher. It was also necessary to be prepared in advance, so far as possible, to address unexpected problems, for example dealing with recorder batteries which suddenly expired during the course of an interview.

Research is a lonely journey in some respects. However, the staged structure of the DProf and the regular workshops with its community of learners proved invaluable. These workshops provided a source of encouragement and motivation. As students, we shared our experiences, and it was helpful to realise that my challenges were similar to those of others students. At the start of my journey I recognised how other Doctoral students near the end of their journey 'spoke a different language', and one which I did not understand. At the end of my journey this language was one which I understood.

My personal professional development has been considerable. I have become more critical of my own pedagogic practice and have modified my own professional activity as a consequence of undertaking this study. I have become more keenly aware of the consequences for students learning and development of assessment design. I appreciate more clearly the need to provide context that supports their learning through authentic assessment. I have acquired insight to the challenges facing students, particularly part-time students, and have come to view support for students and an integrated experience as important for their learning.

As a student I saw a different aspect of the learning experience which was valuable for my own professional practice. I experienced something of the emotions that undergraduates experience receiving feedback. I began to understand the challenge of thinking and writing in ways which I had not previously undertaken. It is my intention to continue with this research after submission of the thesis. I have already laid the groundwork to integrate findings of this research within my appointment as course leader for the FdSc Surveying degree with its first intake of students in September 2019.

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Appendices

Appendix A Front part of conference papers given as part of this study

ASSESSMENT FEEDBACK TO ENHANCE STUDENT DEVELOPMENT AS EFFECTIVE CONSTRUCTION INDUSTRY PRACTITIONERS

Vohmann, B., Crabtree, P., Priddle, J. and Sherratt, F., 2015.

Assessment feedback has been identified as playing a key role in enhancing student learning and academic success, and effective feedback can also promote self-regulating learners which in turn translates to more effective practitioners. There is a considerable amount of literature concerning assessment feedback, however most of the research is generic and does not focus on the needs of particular academic disciplines, nor of relevant professional practice. For built environment students, assessment feedback can strengthen links between academic learning and professional practice, supporting the development of effective construction industry practitioners. To evaluate assessment feedback within this context, a study focusing on links between assessment feedback and professional practice is being undertaken. Early findings are presented here, based on content analysis of assessment feedback on submitted assignments. Data was analysed using a numeric approach, recording frequency of key words. Findings suggest there is scope to enhance practice via the use of revised documents and thus enhance the student learning experience as well as promoting deep learning and development of reflective practitioners. This preliminary study indicates the need to re-consider wording of key documents provided to students.

Keywords: assessment, feedback, professional practice.

PROFESSIONAL PRACTICE AND CONSTRUCTION UNDERGRADUATES' EMPLOYABILITY SKILLS

Vohmann, B. and Frame, I., 2016.

Employability skills are known to be valuable to undergraduates when entering the workplace and expected by employers, yet, in construction as in many disciplines, these skills often are not well developed. However, construction professionals frequently work in complex dynamic environments and employability skills may enhance undergraduates' practitioner effectiveness. Therefore, it is important tutors exploit opportunities to help undergraduates develop their employability skills. This paper examines the extent to which built environment undergraduates in a post-1992 university have opportunity to develop their employability skills through assessment. Data was gathered from students' evaluation of their development of employability skills and from written assessment feedback provided by tutors to students. Thematic analysis of the data was undertaken. Findings suggest students have limited understanding of employability skills and tutors give limited attention to their development. The examination of written feedback supported this latter point - tutors' major concerns were to develop students' subject knowledge and academic skills. It seems, then, promoting development of built environment students' employability skills may be an underused aspect of undergraduate learning provision. This suggests enhancing the student - tutor assessment dialogue offers the opportunity to better prepare students for industry and their professional practice.

Keywords: education, professionalism, undergraduates.

MODE OF STUDY INFLUENCES BUILT ENVIRONMENT STUDENTS' PERCEPTION OF THEIR PROFESSIONAL DEVELOPMENT

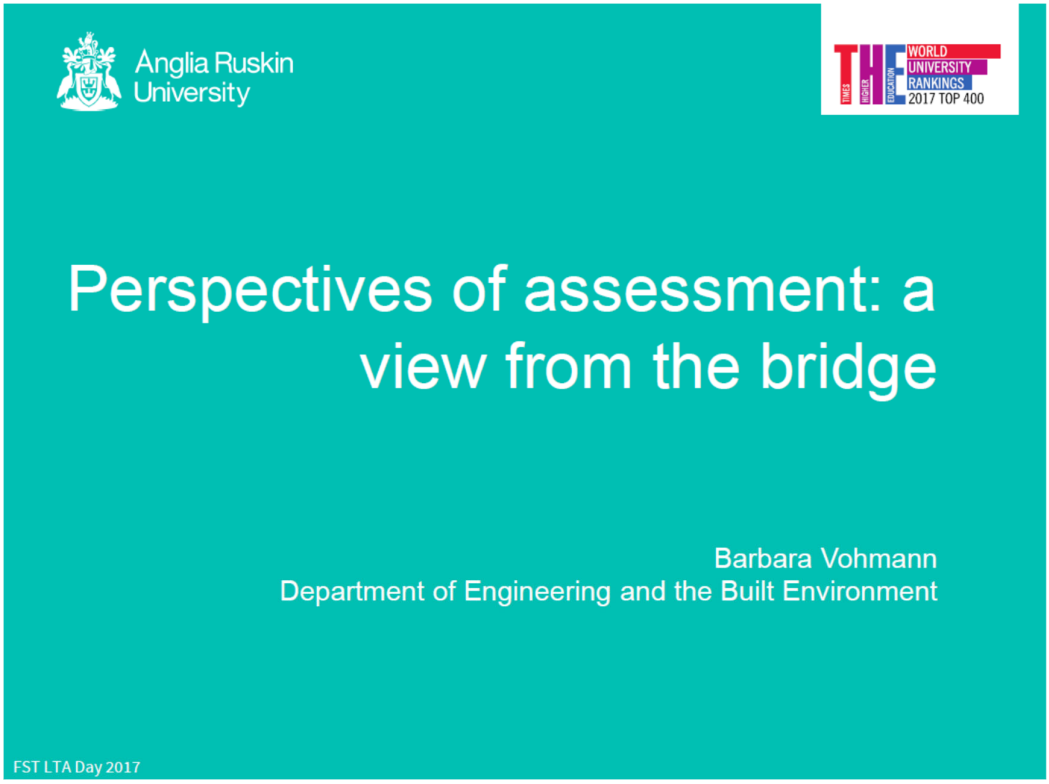
Vohmann, B., Crabtree, P., Priddle, J. and Frame, I., 2017.

Accredited undergraduate courses in construction disciplines are designed to help students develop knowledge and skills to prepare them for professional practice. However, it is recognised that undergraduates are not always as prepared for professional practice as might be desired. The aim of this paper is to examine undergraduates' perceptions regarding how effectively their course prepares them for industry. Students tend, in their academic studies, to focus on assessment, and feedback on assessment has been recognised as an important learning support. Built environment undergraduates at a post-1992 university complete a short paper-based questionnaire at the mid-point of each semester regarding their academic progress and support they may value. This Likert-scaled questionnaire contains 12 statements, plus two free-text questions. Analysis of completed questionnaires reveals mode of study - part-time or full-time - influences student perceptions of their learning experience and its appropriateness to support development of professional practice skills and knowledge. This suggests there may be an opportunity to fine-tune pedagogic practice in order to more effectively support development of undergraduates' professional knowledge and skills.

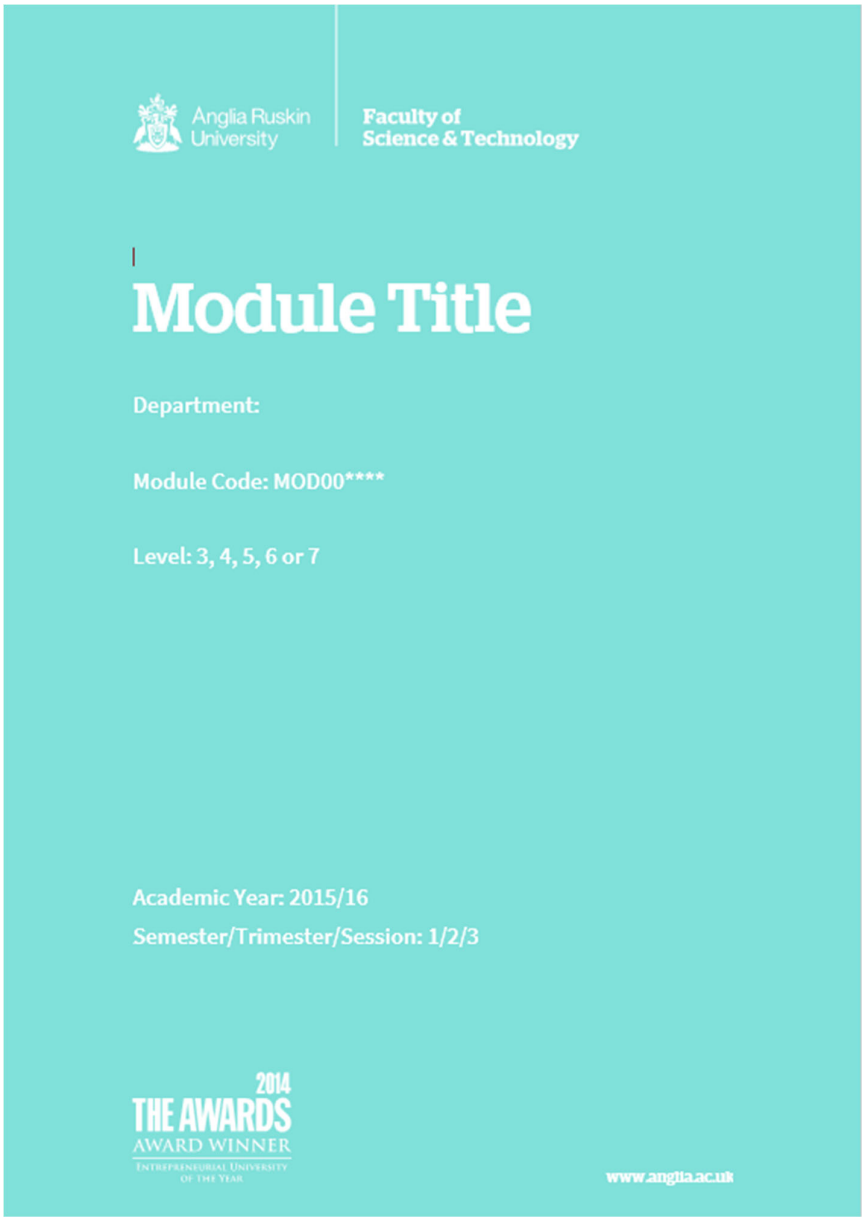
Keywords: learning, part-time, professionalism, undergraduates.

Conference workshop 30 June 2015.

Conference presentation 12 January 2017.


Anglia Ruskin University
THE WORLD UNIVERSITY RANKINGS 2017 TOP 400
Perspectives of assessment: a view from the bridge
Barbara Vohmann
Department of Engineering and the Built Environment
FST LTA Day 2017

Appendix B Faculty module guide template



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This contents list is generated automatically. All existing headings within this template are hyperlinked from the contents list entries. If you wish to add further entries, for instance in Section 4, use the Styles drop-down menu to select an appropriate heading style (use Heading 2+11point – see sub-sections in 8).

If you are pasting in sections from an earlier module guide, it is important that you do not replace the headings in this template, or the content list links may be broken.

When you have completed or finished editing your module guide, update the entries and page numbers in the contents list as follows:

OR

1. *Right click on the table above.*
2. *Choose 'Update Field'*
3. *Select 'Update entire table'*
4. *Select 'OK'*

This will add any new entries that you have included as heading using the appropriate heading style, and will update the page numbers in the list of contents

You can delete unwanted entries from the contents list, which may pick up formatting from imported text.

You should then delete these instructions in red text!

1. Key Information

Module Title:

Module Leader: *Name*
Campus / Building / Room:
Extension:
Email:

Module Tutor(s):

	Name	*Name*	*Name*
Campus / Building / Room:			
Extension:			
Email:			

Every module has a Module Definition Form (MDF) which is the officially validated record of the module. You can access the MDF for this module in three ways via:

- the Virtual Learning Environment (VLE)
- the My Anglia Module Catalogue at www.anglia.ac.uk/modulecatalogue
- Anglia Ruskin's module search engine facility at www.anglia.ac.uk/modules

[Please note that the MDF is NOT required to be included in the Module Guide]

All modules delivered by Anglia Ruskin University at its main campuses in the UK and at Associate Colleges throughout the UK and overseas are governed by the *Academic Regulations*. You can view these at www.anglia.ac.uk/academicregs. An extract of the *Academic Regulations*, known as the *Assessment Regulations*, is available at this website too (all new students will have received a printed copy as part of their welcome pack).

In the unlikely event of any discrepancy between the *Academic Regulations* and any other publication, including this module guide, the *Academic Regulations*, as the definitive document, take precedence over all other publications and will be applied in all cases.

2. Introduction to the Module

Provide an introduction to the Module. As a default, use the Module Description from Section 6a of the MDF, which is obtainable via the Manage My Modules facility on e-vision (staff only) or the module search engine facility www.anglia.ac.uk/modules.

Add any further details that you feel may be of use to students.

3. Learning Outcomes and Outline Delivery

Explain that Anglia Ruskin modules are taught on the basis of intended learning outcomes and that, on successful completion of the module, students will be expected to be able to demonstrate they have met those outcomes. Draw attention to the specific sections of the MDF (eg: by re-producing, or referencing, Section 7 of the MDF, providing additional information and detail to explain what is meant be each outcome). Provide some cross referencing between the intended learning outcomes and the assessment task(s) and related assessment criteria.

The table below is indicative only and can be customised as necessary to provide an outline of the module's delivery

Wk	Lecture	Seminar/Workshop	Student-managed learning
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
etc			

4. Assessment

DEADLINE DATES: SPECIAL ARRANGEMENT FOR 2015/16 ONLY
Semester 1 and Trimester 1

Module Leaders can set any date up to and including **Mon 14 December 2015.**
Alternatively, Module Leaders can set the date of **Tues 5 January 2016.**

The dates **Tues 15 December 2015 – Mon 4 January 2016** (inclusive) cannot be used as deadlines for the submission of student work. This one-off restriction will facilitate the major upgrade of our Student Record System (SITS) during the Christmas and New Year period.

This will reduce potential disruption for students during this period

Assessment Information Form(s):

DESCRIPTIVE TITLE	*How you refer to the assessment within the module.*				**Assessment Element**	010
ASSESSMENT DETAILS	*This is a where you can provide details about the assessment.*					
Learning Outcomes	1 - 4		**Weighting**	40%	**Marking Approach**	Fine Grade / Pass Fail
WHAT IS BEING SUBMITTED	*A description of the item actually being submitted and marked.*					
SUBMISSION	**'Due' Date:**	14/11/15	**Time:**	14:00	**Location**	iCentre / Turnitin / Other
MARKER(S):						
MODERATOR(S):						
FEEDBACK	**Where to get your feedback:**		Collect from … /Turnitin /email /Other		**'Post' Date:**	10/12/15

*Please include a completed copy of this form for **every** summative element of assessment within your module. This information will be used to create Turnitin classes, where applicable. Areas highlighted in YELLOW should be consistent with information in the MDF. Please ensure you update/replace all the white cells in this table. Remember to remove Highlights.*

4.1 Submission

OPTION A

THE FOLLOWING GUIDANCE IS FOR MODULES WITH ASSESSMENT TASKS THAT WILL BE SUBMITTED VIA TURNITIN/GRADEMARK®.

IF YOUR MODULE WILL REQUIRE ASSESSMENT TASKS TO BE SUBMITTED TO THE I-CENTRES OR OTHER PHYSICAL LOCATION, DELETE OPTION A AND USE OPTION B BELOW.

IF YOUR MODULE'S ASSESSMENT TASKS WILL USE A COMBINATION OF BOTH GRADEMARK ® AND I-CENTRE SUBMISSION THEN USE AN APPROPRIATE COMBINATION OF BOTH.

Explain how the module will be assessed, by referring to Section 9 of the MDF as appropriate, and providing more detail as necessary (ie: include the assignment brief (eg: a set of essay questions) where

relevant. If the assessment task(s) has yet to be approved by the external examiner, clearly state it is draft and a provisional date for when it will be confirmed.

NB: it is a national requirement that ALL assessment methods require the approval of the relevant external examiner prior to their use (not just examination papers).

Make sure weightings are clear if there is more than one assessment task.

Provide some cross referencing between the assessment task(s), the related assessment criteria and the intended learning outcomes.

Confirm the deadline date (and new time of 2pm) for submission of assessment tasks. Details of the final assessment deadline dates which can be set in each delivery period, in accordance with the Academic Calendar, are available here. Please note that later deadlines are not permitted. ***SEE SPECIAL NOTICE ABOVE FOR THE 2015/16 ACADEMIC YEAR***

Provide details of how to use Turnitin/GradeMark® (or where further advice is available). Also explain how feedback on performance will be made available to students (eg: on-line though Turnitin/GradeMark® or by e-mail etc.), stressing the importance of reading the feedback.

The following text is provided for you to use (with appropriate amendment, where necessary)

All coursework assignments and other forms of assessment must be submitted by the published deadline which is detailed above. It is your responsibility to know when work is due to be submitted – ignorance of the deadline date will not be accepted as a reason for late or non-submission.

All student work which contributes to the eventual outcome of the module (ie: if it determines whether you will pass or fail the module and counts towards the mark you achieve for the module) is submitted via Turnitin/GradeMark®. You CANNOT submit work for this module via the iCentres. Additionally, academic staff CANNOT accept this work directly from you. *[please note that this sentence only refers to work submitted via GradeMark® and does not prevent colleagues accepting work at the end of other forms of assessment such as an in-class test]*

Any late work (posted to Turnitin/Grademark®) will NOT be considered and a mark of zero will be awarded for the assessment task in question.

You must keep a copy of your work.

Submission process via Turnitin/Grademark®

You will have received an email to your STUDENT email account, informing you that you've enrolled in a Turnitin/Grademark® class for this module. When you log into Turnitin/Grademark®, you will see information about the module, such as the start date, due date and time (GMT) for your assignment, and the latest date on which your results will be made available (post date), will be given. Once the post date has passed, you will be able to view your feedback and grade.

PLEASE NOTE:

You will only have one opportunity to submit to this Turnitin/Grademark® class so make sure that what you submit is the work you want to be marked. If you submit a draft it cannot be removed and will be marked. If you submit to the wrong class, or the faculty Turnitin® site that you use for generating an originality report, it will be treated as a non-submission and recorded as a fail. Neither of these are subject to mitigation or academic appeal.

Please submit **before** the due date and time given. This is given as Greenwich Mean Time (GMT) adjusted for daylight savings, so please work out, in advance, your local time difference. The submission time is the point at which the document finishes uploading, not when it starts. There is sometimes

substantial time needed to submit work in this way, depending on the use being made of the system, so it is not recommended to leave electronic submission to the last minute.

More detailed information on using Turnitin/Grademark® is available on the VLE, at https://vle.anglia.ac.uk/sites/LTA/Grademark/Content/Home.aspx.

Feedback on your work

You are entitled to feedback on your performance for all your assessed work. For all assessment tasks which are not examinations, this is accomplished by a member of academic staff providing your mark and associated comments which will relate to the achievement of the module's intended learning outcomes and the assessment criteria you were given for the task when it was first issued. This feedback will be available on-line via Turnitin/Grademark or may be sent directly to your Anglia Ruskin e-mail account.

Examination scripts are retained by Anglia Ruskin and are not returned to students. However, you are entitled to feedback on your performance in an examination and may request a meeting with the Module Leader or Tutor to see your examination script and to discuss your performance.

Anglia Ruskin is committed to providing you with feedback on all assessed work within **20 working days** of the submission deadline or the date of an examination. This is extended to 30 days for feedback for a Major Project module (please note that working days excludes those days when Anglia Ruskin University is officially closed; eg: between Christmas and New Year). Personal tutors will offer to read feedback from several modules and help you to address any common themes that may be emerging.

On occasion, you will receive feedback and marks for pieces of work that you completed in the earlier stages of the module. We provide you with this feedback as part of the learning experience and to help you prepare for other assessment tasks that you have still to complete. It is important to note that, in these cases, the marks for these pieces of work are **unconfirmed**. **This means that, potentially, marks can change, in either direction**!

Marks for modules and individual pieces of work become confirmed on the Dates for the Official Publication of Results, which can be checked at www.anglia.ac.uk/results.

OPTION B

THE FOLLOWING GUIDANCE IS FOR MODULES WITH ASSESSMENT TASKS THAT WILL BE SUBMITTED TO THE I-CENTRES OR OTHER PHYSICAL LOCATION.

IF YOUR MODULE WILL REQUIRE ASSESSMENT TASKS TO BE SUBMITTED VIA GRADEMARK ®, DELETE OPTION B AND USE OPTION A ABOVE.

IF YOUR MODULE'S ASSESSMENT TASKS WILL USE A COMBINATION OF BOTH GRADEMARK ® AND I-CENTRE SUBMISSION THEN USE AN APPROPRIATE COMBINATION OF BOTH.

Explain how the module will be assessed, by referring to Section 9 of the MDF as appropriate, and providing more detail as necessary (ie: include the assignment brief (eg: a set of essay questions) where relevant. If the assessment task(s) has yet to be approved by the external examiner, clearly state it is draft and a provisional date for when it will be confirmed.

NB: it is a national requirement that ALL assessment methods require the approval of the relevant external examiner prior to their use (not just examination papers).

Make sure weightings are clear if there is more than one assessment task.

Provide some cross referencing between the assessment task(s), the related assessment criteria and the intended learning outcomes.

Confirm the deadline date (and new time of 2pm) for submission of assessment tasks. Details of the final assessment deadline dates which can be set in each delivery period, in accordance with the Academic Calendar, are available here. Please note that later deadlines are not permitted. ***SEE SPECIAL NOTICE ABOVE FOR THE 2015/16 ACADEMIC YEAR***

Provide details of the Faculty's arrangements for returning assessed work to students and the importance of collecting assessed work and the accompanying feedback.

The following text is provided for you to use (with appropriate amendment, where necessary)

All coursework assignments and other forms of assessment must be submitted by the published deadline which is detailed above. It is your responsibility to know when work is due to be submitted – ignorance of the deadline date will not be accepted as a reason for late or non-submission.

All student work which contributes to the eventual outcome of the module (ie: if it determines whether you will pass or fail the module and counts towards the mark you achieve for the module) is submitted via the iCentre using the formal submission sheet *[REPLACE WITH EQUIVALENT OFFICE/LOCATION AT ASSOCIATE COLLEGE OR ALTERNATIVE FOR ASSESSMENT TASKS WHERE THE iCENTRE IS INAPPROPRIATE (EG: MAJOR PIECES OF ART WORK/OTHER ARTEFACTS)]*. Academic staff CANNOT accept this work directly from you. *[please note that this sentence only refers to work submitted via the iCentres and does not prevent colleagues accepting work at the end of other forms of assessment such as an in-class test]*

If you decide to submit your work to the iCentre *[REPLACE WITH EQUIVALENT AT ASSOCIATE COLLEGE]* by post, it must arrive by midday on the due date. If you elect to post your work, you do so at your own risk and you must ensure that sufficient time is provided for your work to arrive at the iCentre *[REPLACE WITH EQUIVALENT AT ASSOCIATE COLLEGE]*. Posting your work the day before a deadline, albeit by first class post, is extremely risky and not advised.

Any late work (submitted in person or by post) will NOT be accepted and a mark of zero will be awarded for the assessment task in question.

You are requested to keep a copy of your work.

Feedback on your work

You are entitled to feedback on your performance for all your assessed work. For all assessment tasks which are not examinations, this is provided by a member of academic staff completing the assignment coversheet on which your mark and feedback will relate to the achievement of the module's intended learning outcomes and the assessment criteria you were given for the task when it was first issued. This feedback may be completed electronically and sent directly to your Anglia Ruskin e-mail account.

Examination scripts are retained by Anglia Ruskin and are not returned to students. However, you are entitled to feedback on your performance in an examination and may request a meeting with the Module Leader or Tutor to see your examination script and to discuss your performance.

Anglia Ruskin is committed to providing you with feedback on all assessed work within **20 working days** of the submission deadline or the date of an examination. This is extended to 30 days for feedback for a Major Project module (please note that working days excludes those days when Anglia Ruskin University is officially closed; eg: between Christmas and New Year). Personal tutors will offer to read feedback from several modules and help you to address any common themes that may be emerging.

At the main Anglia Ruskin University campuses, each Faculty will publish details of the arrangement for the return of your assessed work (eg: a marked essay or case study etc.). [REPLACE WITH EQUIVALENT AT ASSOCIATE COLLEGE] Any work which is not collected by you from the Faculty within this timeframe is returned to the iCentres from where you can subsequently collect it. The iCentres retain student work for a specified period prior to its disposal. [REPLACE WITH EQUIVALENT AT ASSOCIATE COLLEGE]

On occasion, you will receive feedback and marks for pieces of work that you completed in the earlier stages of the module. We provide you with this feedback as part of the learning experience and to help you prepare for other assessment tasks that you have still to complete. It is important to note that, in these cases, the marks for these pieces of work are **unconfirmed**. **This means that, potentially, marks can change, in either direction!**

Marks for modules and individual pieces of work become confirmed on the Dates for the Official Publication of Results, which can be checked at www.anglia.ac.uk/results.

5. Learning Resources
5.1. Library

ReadingLists@Anglia

The Learning Teaching and Assessment Strategy 2015-17 provides online Reading List targets for all live modules. For the academic year 2015/16 all modules should have an online reading list for students to access. If you require assistance in creating or updating your list please contact your subject team: **Delete all red guidance text.**

Module Resource List:
(copy the URL of your list and paste it in here)

Library Contact

Faculty of Science and Technology
libteam.fst@anglia.ac.uk

5.2. Other Resources

Provide details of e.g. laboratories, studios, museums, art galleries, work-based learning environments, etc.……). You may be able to refer to the relevant information from Section 6d 'Specialist Learning Resources' of the MDF.

6. How is My Work Marked?

After you have handed your work in or you have completed an examination, Anglia Ruskin undertakes a series of activities to assure that our marking processes are comparable with those employed at other universities in the UK and that your work has been marked fairly, honestly and consistently. These include:

- **Anonymous marking –** your name is not attached to your work so, at the point of marking, the lecturer does not know whose work he/she is considering. When you undertake an assessment task where your identity is known (eg: a presentation or Major Project), it is marked by more than one lecturer (known as double marking)

- **Internal moderation –** a sample of all work for each assessment task in each module is moderated by other Anglia Ruskin staff to check the standards and consistency of the marking

- **External moderation –** a sample of student work for all modules is moderated by external examiners – experienced academic staff from other universities (and sometimes practitioners who represent relevant professions) - who scrutinise your work and provide Anglia Ruskin academic staff with feedback, advice and assurance that the marking of your work is comparable to that in other UK universities. Many of Anglia Ruskin's staff act as external examiners at other universities.

- **Departmental Assessment Panel (DAP) –** performance by all students on all modules is discussed and approved at the appropriate DAPs which are attended by all relevant Module Leaders and external examiners. Anglia Ruskin has over 25 DAPs to cover all the different subjects we teach.

This module falls within the remit of the *[ENTER TITLE OF DAP HERE]* DAP.

The following external examiners are appointed to this DAP and will oversee the assessment of this and other modules within the DAP's remit:

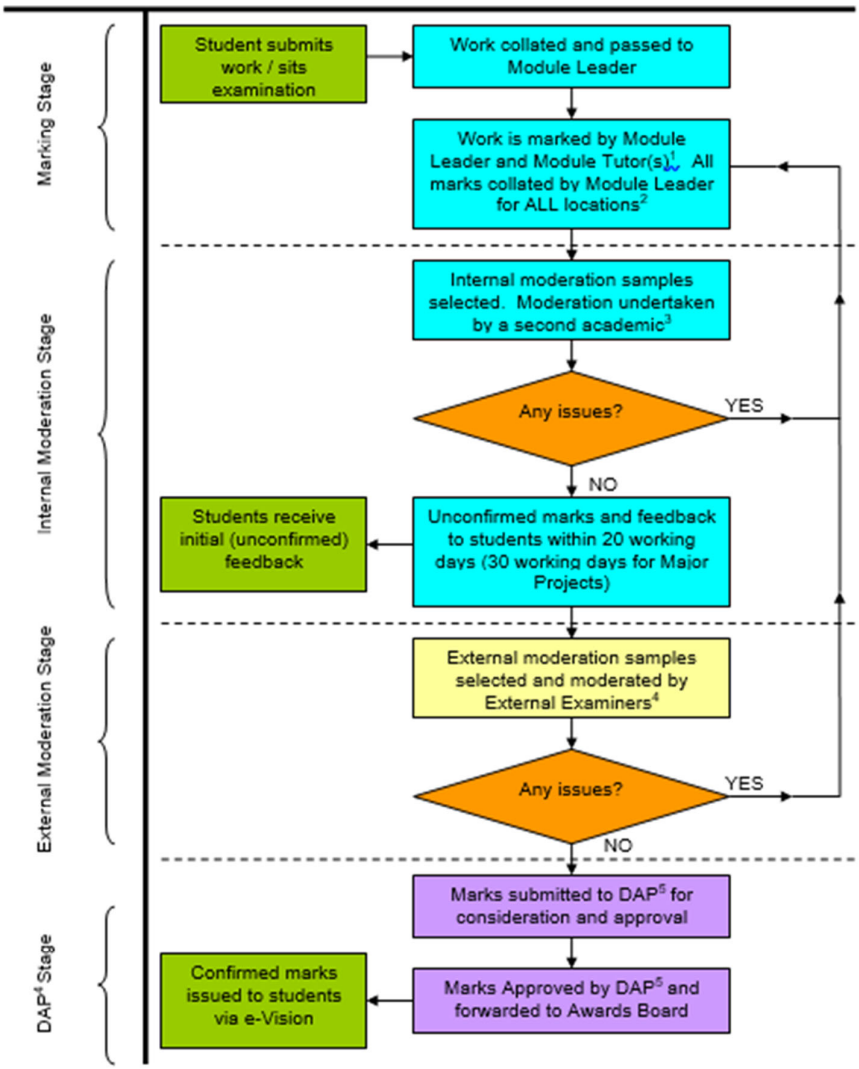
[Enter details of the names, home institutions and positions of external examiners in the table below. An up-to-date list of external examiners for each DAP can be accessed at www.anglia.ac.uk/eeinfo.
NB: It is a national requirement that we publish the names and home institutions of our external examiners to students]

External Examiner's Name	Academic Institution	Position or Employer
~~Dr. Xxxx Xxxxx~~	*University of XXX*	*Senior Lecturer*
Mr ~~Aaaa Bbbbb~~	*None*	*Freelance Journalist*

The above list is correct at the time of publication. However, external examiners are appointed at various points throughout the year. An up-to-date list of external examiners is available to students and staff at www.anglia.ac.uk/eeinfo.

Anglia Ruskin's marking process is represented in the flowchart below:

Flowchart of Anglia Ruskin's Marking Processes



1 All work is marked anonymously or double marked where identity of the student is known (eg; in a presentation)
2 The internal (and external) moderation process compares work from all locations where the module is delivered (eg; Cambridge, Chelmsford, Peterborough, Malaysia, India, Trinidad etc.)
3 The sample for the internal moderation process comprises a minimum of eight pieces of work or 10% (whichever is the greater) for each marker and covers the full range of marks
4 Only modules at levels 5, 6 and 7 are subject to external moderation (unless required for separate reasons). The sample for the external moderation process comprises a minimum of eight pieces of work or 10% (whichever is the greater) for the entire module and covers the full range of marks
5 DAP: Departmental Assessment Panel – Anglia Ruskin has over 25 different DAPs to reflect our subject coverage

7. Assessment Criteria and Marking Standards

On the following pages are the tables of the generic assessment criteria and marking standards for Level 3 through to Level 7. Please remove those pages that do not relate to this module.

NOTE: These criteria provide a generic framework; they can be customised in the module guide to suit different subjects, different assessment tasks, and specific learning outcomes. It may be useful to add a subheading such as 'Specific Assessment Criteria'.

Where a Department takes a view that the nature of the discipline and/or a particular assessment method requires a threshold level of proficiency in English, this must be communicated to the students and incorporated into a customised marking scheme. Module Leaders may wish to paste the guidance provided in the Senate Code of Practice on the Assessment of Students into Module Guides.

This page is a separate document section, and has been formatted to accommodate the smaller margins that are necessary to keep each level to a single page of generic assessment criteria. Removing the section/page breaks will disrupt the formatting.

ANGLIA RUSKIN UNIVERSITY GENERIC ASSESSMENT CRITERIA AND MARKING STANDARDS

LEVEL 3

Level 3 (Access) prepares students to function effectively at Level 4. Criteria for assessment at Level 3 reflect the preparatory nature of these modules. Students are expected to demonstrate the acquisition of generic learning skills appropriate for self-managed learning in an HE context. Students are expected to demonstrate that they have acquired the underpinning discipline-specific skills, knowledge and understanding necessary to undertake a programme of higher education

Mark Bands		Outcome	Generic Learning Outcomes (GLOs) (Academic Regulations, Section 2)	
			Knowledge & Understanding	Intellectual (thinking), Practical, Affective and Transferable Skills
Characteristics of Student Achievement by Marking Band	90-100%	*Achieves module outcome(s) related to GLO at this level*	Exceptional information base and understanding of ethical issues	Exceptional management of learning resources. Exceptional leadership and contributions to teams. Structured and accurate expression. Demonstrates exceptional intellectual originality and imagination. Exceptional practical/professional skills
	80-89%		Outstanding information base and understanding of ethical issues	Outstanding management of learning resources. Provides an exemplar of leadership and contributions to teams. Structured and accurate expression. Demonstrates outstanding intellectual originality and imagination. Outstanding practical/professional skills
	70-79%		Excellent information base and understanding of ethical issues	Excellent management of learning resources. Contributes well to teams. Structured and largely accurate expression. excellent academic/ intellectual skills and practical/ professional skills
	60-69%		Good information base covering all major/ ethical issues	Good management of learning resources. Expression is structured and mainly accurate. Good academic/ intellectual skills. and team/practical/professional skills
	50-59%		Satisfactory information base covering most major issues and their ethical dimension	Satisfactory use of learning resources. Expression shows some lack of structure and/or accuracy. Acceptable but undistinguished skill sets. Satisfactory team/practical/ professional skills
	40-49%	*A marginal pass in module outcome(s) related to GLO at this level*	Basic information base; basic understanding of major/ ethical issues of discipline	Basic use of learning resources, with significant lack of structure and/or accuracy in expression. Some issues with academic/intellectual skills. Basic team/practical/ professional skills
	30-39%	*A marginal fail in module outcome(s) related to GLO at this level. Possible compensation. Satisfies qualifying mark*	Limited information base; limited understanding of discipline and its ethical dimension	Limited use of learning resources with little contribution to team work. Weak academic/intellectual skills and difficulty with expression. Insecure practical/professional skills
	20-29%	*Fails to achieve module outcome(s) related to this GLO. Qualifying mark not satisfied. No compensation available*	Little evidence of an information base; little evidence of understanding of discipline and its ethical dimension	Little evidence of use of learning resources with little evidence of contribution to team work. Very weak academic/intellectual skills and difficulty with expression. Little evidence of practical/professional skills
	10-19%		Inadequate information base; inadequate understanding of discipline and its ethical dimension.	Inadequate use of learning resources with inadequate contribution to team work. Very weak academic/ intellectual skills and difficulty with expression. Inadequate practical/ professional skills
	1-9%		No evidence of any information base; no understanding of discipline and its ethical dimension.	No evidence of use of learning resources with no evidence of contribution to team work. No evidence academic/ intellectual skills and incoherent expression. No evidence of practical/ professional skills
	0%		Awarded for: (i) non-submission; (ii) dangerous practice and; (iii) in situations where the student fails to address the assignment brief (eg: answers the wrong question) and/or related learning outcomes	

ANGLIA RUSKIN UNIVERSITY GENERIC ASSESSMENT CRITERIA AND MARKING STANDARDS

LEVEL 4

Level 4 introduces students to HE. Students are expected to demonstrate relevant skills and competencies; to be articulate in expressing ideas orally; and to be coherent and structured in terms of written or other media. Forms of expression at this level may be descriptive or imitative, but students are expected to demonstrate an increasing understanding of the theoretical background of their study and the analytic competence to explore it, as well as its relationship, where appropriate, to particular skills. Students are expected to develop an awareness of strengths and weaknesses in their skill sets

Mark Bands		Outcome	Generic Learning Outcomes (GLOs) (Academic Regulations, Section 2)	
			Knowledge & Understanding	**Intellectual (thinking), Practical, Affective and Transferable Skills**
Characteristics of Student Achievement by Marking Band	90-100%	*Achieves module outcome(s) related to GLO at this level*	Exceptional information base exploring and analysing the discipline, its theory and ethical issues with extraordinary originality.	Exceptional management of learning resources, complemented by assured self-direction/exploration. Exceptional structure/accurate expression. Demonstrates exceptional intellectual originality and imagination. Exceptional practical/professional skills.
	80-89%		Outstanding information base exploring and analysing the discipline, its theory and ethical issues with clear originality	Outstanding management of learning resources, complemented by assured self-direction/exploration. An exemplar of structured/accurate expression. Demonstrates outstanding intellectual originality and imagination. Outstanding practical/professional skills
	70-79%		Excellent information base, exploring and analysing the discipline, its theory and ethical issues with considerable originality.	Excellent management of learning resources, complemented by self-direction/exploration. Structured/ accurate expression. Excellent academic/intellectual and team/practical/professional skills
	60-69%		Good information base; explores and analyses the discipline, its theory and ethical issues with some originality	Good management of learning resources with some self-direction. Structured and mainly accurate expression. Good academic/intellectual skills and team/practical/ professional skills
	50-59%		Satisfactory information base that begins to explore and analyse the discipline and its ethical issues but is still mainly imitative	Satisfactory use of learning resources and input to team work. Some lack of structure/accuracy in expression. Acceptable academic/intellectual skills and satisfactory practical/professional skills
	40-49%	*A marginal pass in module outcome(s) related to GLO at this level*	Basic information base; omissions in understanding of major/ethical issues. Largely imitative	Basic use of learning resources with no self-direction. Some input to team work. Some difficulty with structure and accuracy in expression. Some difficulties with academic/intellectual skills and developing practical/ professional skills
	30-39%	*A marginal fail in module outcome(s) related to GLO at this level. Possible compensation. Sat-isfies qualifying mark*	Limited information base; limited understanding of discipline and its ethical dimension	Limited use of learning resources. No self-direction, little input to team work and difficulty with structure/accuracy in expression. Weak academic/intellectual skills. Practical/professional skills are not yet secure
	20-29%	*Fails to achieve module outcome(s) related to this GLO. Qualifying mark not satisfied. No compensation available*	Little evidence of an information base. Little evidence of understanding of discipline and its ethical dimension.	Little evidence of use of learning resources. No self-direction, with little evidence of contribution to team work. Very weak academic/intellectual skills and significant difficulties with structure/expression. Little evidence of practical/professional skills
	10-19%		Inadequate information base. Inadequate understanding of discipline and its ethical dimension.	Inadequate use of learning resources. No attempt at self-direction with inadequate contribution to team work. Very weak academic/intellectual skills and major difficulty with structure/expression. Inadequate practical/professional skills
	1-9%		No evidence of any information base. No understanding of discipline and its ethical dimension.	No evidence of use of learning resources of understanding of self-direction with no evidence of contribution to team work. No evidence academic/intellectual skills and incoherent structure/ expression. No evidence of practical/ professional skills
	0%		Awarded for: (i) non-submission; (ii) dangerous practice and; (iii) in situations where the student fails to address the assignment brief (eg: answers the wrong question) and/or related learning outcomes	

ANGLIA RUSKIN UNIVERSITY GENERIC ASSESSMENT CRITERIA AND MARKING STANDARDS

LEVEL 5

Level 5 reflects continuing development from Level 4. At this level students are not fully autonomous but are able to take responsibility for their own learning with some direction. Students are expected to locate an increasingly detailed theoretical knowledge of the discipline within a more general intellectual context, and to demonstrate this through forms of expression which go beyond the merely descriptive or imitative. Students are expected to demonstrate analytical competence in terms both of problem identification and resolution, and to develop their skill sets as required.

Mark Bands		Outcome	Generic Learning Outcomes (GLOs) (Academic Regulations, Section 2)	
			Knowledge & Understanding	Intellectual (thinking), Practical, Affective and Transferable Skills
Characteristics of Student Achievement by Marking Band	90-100%	*Achieves module outcome(s) related to GLO at this level*	Exceptional information base exploring and analysing the discipline, its theory and ethical issues with extraordinary originality and autonomy.	Exceptional management of learning resources, with a higher degree of autonomy/ exploration that clearly exceeds the brief. Exceptional structure/accurate expression. Demonstrates exceptional intellectual originality and imagination. Exceptional team/practical/ professional skills.
	80-89%		Outstanding information base exploring and analysing the discipline, its theory and ethical issues with clear originality and autonomy	Outstanding management of learning resources, with a degree of autonomy/exploration that clearly exceeds the brief. An exemplar of structured/accurate expression. Demonstrates outstanding intellectual originality and imagination. Outstanding team/practical/professional skills
	70-79%		Excellent knowledge base, exploring and analysing the discipline, its theory and ethical issues with considerable originality and autonomy	Excellent management of learning resources, with a degree of autonomy/exploration that may exceed the brief. Structured/accurate expression. Excellent academic/ intellectual skills and team/practical/professional skills
	60-69%		Good knowledge base; explores and analyses the discipline, its theory and ethical issues with some originality, detail and autonomy	Good management of learning with consistent self-direction. Structured and mainly accurate expression. Good academic/intellectual skills and team/practical/ professional skills
	50-59%		Satisfactory knowledge base that begins to explore and analyse the theory and ethical issues of the discipline	Satisfactory use of learning resources. Acceptable structure/accuracy in expression. Acceptable level of academic/intellectual skills, going beyond description at times. Satisfactory team/practical/professional skills. Inconsistent self-direction
	40-49%	*A marginal pass in module outcome(s) related to GLO at this level*	Basic knowledge base with some omissions and/or lack of theory of discipline and its ethical dimension	Basic use of learning resources with little self-direction. Some input to team work. Some difficulties with academic/ intellectual skills. Largely imitative and descriptive. Some difficulty with structure and accuracy in expression, but developing practical/professional skills
	30-39%	*A marginal fail in module outcome(s) related to GLO at this level. Possible compensation. Satisfies qualifying mark*	Limited knowledge base; limited understanding of discipline and its ethical dimension	Limited use of learning resources, working towards self-direction. General difficulty with structure and accuracy in expression. Weak academic/intellectual skills. Still mainly imitative and descriptive. Team/practical/professional skills that are not yet secure
	20-29%	*Fails to achieve module outcome(s) related to this GLO. Qualifying mark not satisfied. No compensation available*	Little evidence of an information base. Little evidence of understanding of discipline and its ethical dimension	Little evidence of use of learning resources. No self-direction, with little evidence of contribution to team work. Very weak academic/intellectual skills and significant difficulties with structure/expression. Very imitative and descriptive. Little evidence of practical/professional skills
	10-19%		Inadequate information base. Inadequate understanding of discipline and its ethical dimension	Inadequate use of learning resources. No attempt at self-direction with inadequate contribution to team work. Very weak academic/intellectual skills and major difficulty with structure/expression. Wholly imitative and descriptive. Inadequate practical/professional skills
	1-9%		No evidence of any information base. No understanding of discipline and its ethical dimension	No evidence of use of learning resources of understanding of self-direction with no evidence of contribution to team work. No evidence academic/intellectual skills and incoherent structure/ expression. No evidence of practical/ professional skills
	0%		Awarded for: (i) non-submission; (ii) dangerous practice and; (iii) in situations where the student fails to address the assignment brief (eg: answers the wrong question) and/or related learning outcomes	

ANGLIA RUSKIN UNIVERSITY GENERIC ASSESSMENT CRITERIA AND MARKING STANDARDS

LEVEL 6

Level 6 is characterised by an expectation of students' increasing autonomy in relation to their study and developing skill sets. Students are expected to demonstrate problem solving skills, both theoretical and practical. This is supported by an understanding of appropriate theory; creativity of expression and thought based in individual judgement; and the ability to seek out, invoke, analyse and evaluate competing theories or methods of working in a critically constructive and open manner. Output is articulate, coherent and skilled in the appropriate medium, with some students producing original or innovative work in their specialism.

Mark Bands		Outcome	Generic Learning Outcomes (GLOs) (Academic Regulations, Section 2)	
			Knowledge & Understanding	Intellectual (thinking), Practical, Affective and Transferable Skills
Characteristics of Student Achievement by Marking Band	90-100%	*Achieves module outcome(s) related to GLO at this level*	Exceptional information base exploring and analysing the discipline, its theory and ethical issues with extraordinary originality and autonomy. Work may be considered for publication within Anglia Ruskin University	Exceptional management of learning resources, with a higher degree of autonomy/exploration that clearly exceeds the assessment brief. Exceptional structure/accurate expression. Demonstrates exceptional intellectual originality and imagination. Exceptional team/practical/professional skills. Work may be considered for publication within Anglia Ruskin University
	80-89%		Outstanding information base exploring and analysing the discipline, its theory and ethical issues with clear originality and autonomy	Outstanding management of learning resources, with a degree of autonomy/exploration that clearly exceeds the assessment brief. An exemplar of structured/accurate expression. Demonstrates outstanding intellectual originality and imagination. Outstanding team/practical/professional skills
	70-79%		Excellent knowledge base that supports analysis, evaluation and problem-solving in theory/practice/ethics of discipline with considerable originality	Excellent management of learning resources, with degree of autonomy/research that may exceed the assessment brief. Structured and creative expression. Excellent academic/ intellectual skills and practical/team/professional/problem-solving skills
	60-69%		Good knowledge base that supports analysis, evaluation and problem-solving in theory/ practice/ethics of discipline with some originality	Good management of learning resources, with consistent self-directed research. Structured and accurate expression. Good academic/intellectual skills and team/practical/ professional/problem solving skills
	50-59%		Satisfactory knowledge base that supports some analysis, evaluation and problem-solving in theory\practice/ethics of discipline	Satisfactory management of learning resources. Some autonomy in research but inconsistent. Structured and mainly accurate expression. Acceptable level of academic/ intellectual skills going beyond description at times. Satisfactory team/practical/professional/problem-solving skills
	40-49%	*A marginal pass in module outcome(s) related to GLO at this level*	Basic knowledge base with some omissions at the level of theoretical/ethical issues. Restricted ability to discuss theory and/or or solve problems in discipline	Basic use of learning resources with little autonomy. Some difficulties with academic/intellectual skills. Some difficulty with structure/accuracy in expression, but evidence of developing team/practical/professional/problem-solving skills
	30-39%	*A marginal fail in module outcome(s) related to GLO at this level. Possible compensation. Satisfies qualifying mark*	Limited knowledge base. Limited understanding of discipline/ethical issues. Difficulty with theory and problem solving in discipline	Limited use of learning resources. Unable to work autonomously. Little input to teams. Weak academic/ intellectual skills. Still mainly descriptive. General difficulty with structure/accuracy in expression. Practical/professional/ problem-solving skills that are not yet secure
	20-29%	*Fails to achieve module outcome(s) related to this GLO. Qualifying mark not satisfied. No compensation available*	Little evidence of knowledge base. Little evidence of understanding of discipline/ethical issues. Significant difficulty with theory and problem solving in discipline	Little evidence of use of learning resources. Unable to work autonomously. Little input to teams. Very weak academic/ intellectual skills. Work significantly descriptive. Significant difficulty with structure/accuracy in expression. Little evidence of practical/professional/problem-solving skills
	10-19%		Inadequate knowledge base. Inadequate understanding of discipline/ethical issues. Major difficulty with theory and problem solving in discipline	Inadequate use of learning resources. Unable to work autonomously. Inadequate input to teams. Extremely weak academic/intellectual skills. Work significantly descriptive. Major difficulty with structure/accuracy in expression. Inadequate practical/professional/ problem-solving skills
	1-9%		No evidence of knowledge base; no evidence of understanding of discipline/ethical issues. Total inability with theory and problem solving in discipline	No evidence of use of learning resources. Completely unable to work autonomously. No evidence of input to teams. No evidence of academic/intellectual skills. Work wholly descriptive. Incoherent structure/accuracy and expression. No evidence of practical/professional/ problem-solving skills
	0%		Awarded for: (i) non-submission; (ii) dangerous practice and; (iii) in situations where the student fails to address the assignment brief (eg: answers the wrong question) and/or related learning outcomes	

ANGLIA RUSKIN UNIVERSITY GENERIC ASSESSMENT CRITERIA AND MARKING STANDARDS

LEVEL 7

Level 7 is characterised by an expectation of students' expertise in their specialism. Students are semi-autonomous, demonstrating independence in the negotiation of assessment tasks (including the major project) and the ability to evaluate, challenge, modify and develop theory and practice. Students are expected to demonstrate an ability to isolate and focus on the significant features of problems and to offer synthetic and coherent solutions, with some students producing original or innovative work in their specialism that is worthy of publication or public performance or display.

Mark Bands		Outcome	Generic Learning Outcomes (GLOs) (Academic Regulations, Section 2)	
			Knowledge & Understanding	Intellectual (thinking), Practical, Affective and Transferable Skills
Characteristics of Student Achievement by Marking Band	90-100%	*Achieves module outcome(s) related to GLO at this level*	Exceptional analysis of key issues/concepts/ethics with very clear originality and autonomy. Exceptional development of conceptual structures and argument making an exceptional use of scholarly conventions. Demonstrates independence of thought and a very high level of intellectual rigour and consistency. Work pushes the boundaries of the discipline and may be considered for external publication	Exceptional analysis of key issues/concepts/ethics. Exceptional development of conceptual structures and argument, making consistent use of scholarly conventions. Exceptional research skills, independence of thought, an extremely high level of intellectual rigour and consistency, exceptional expressive/professional skills, and substantial creativity and originality. Exceptional academic/intellectual skills. Work pushes the boundaries of the discipline and may be considered for external publication
	80-89%		Outstanding analysis of key issues/concepts/ethics with clear originality and autonomy. Outstanding development of conceptual structures and argument making an exemplary use of scholarly conventions. Demonstrates independence of thought and a very high level of intellectual rigour and consistency	Outstanding analysis of key issues/concepts/ethics. Very high level development of conceptual structures and argument, making consistent use of scholarly conventions. Outstanding research skills, independence of thought, a high level of intellectual rigour and consistency, outstanding expressive/professional skills, and considerable creativity and originality. Exemplary academic/intellectual skills
	70-79%		Excellent analysis of key issues/concepts/ethics. Excellent development of conceptual structures and argument making excellent use of scholarly conventions. Demonstrates independence of thought and a high level of intellectual rigour and consistency	Excellent analysis of key issues/concepts/ethics. High level development of conceptual structures and argument, making consistent use of scholarly conventions. Excellent research skills, independence of thought, a high level of intellectual rigour and consistency, excellent expressive/ professional skills, and considerable creativity and originality. Excellent academic/intellectual skills, and considerable creativity and originality
	60-69%		Good analysis of key issues/concepts/ethics. Development of conceptual structures and argument making consistent use of scholarly conventions	Good analysis of key issues/concepts/ethics. Development of conceptual structures and argument, making consistent use of scholarly conventions
	50-59%		Satisfactory knowledge of key issues/ concepts/ethics in discipline. Descriptive in parts but some ability to synthesise scholarship and argument. Minor lapses in use of scholarly conventions	Satisfactory knowledge of key issues/ concepts/ethics in discipline. Descriptive in parts but some ability to synthesise scholarship and argument. Minor lapses in use of scholarly conventions
	40-49%	*A marginal pass in module outcome(s) related to GLO at this level*	Basic knowledge of key issues/concepts/ethics in discipline. Generally descriptive, with restricted synthesis of existing scholarship and little argument. Use of scholarly conventions inconsistent	Basic knowledge of key issues/concepts/ethics in discipline. Generally descriptive, with restricted synthesis of existing scholarship and little argument. Use of scholarly conventions inconsistent.
	30-39%	*A marginal fail in module outcome(s) related to GLO at this level. Satisfies qualifying mark*	Limited knowledge of key issues/concepts/ethics in discipline. Largely descriptive, with restricted synthesis of existing scholarship and limited argument. Limited use of scholarly conventions.	Limited research skills impede use of learning resources and problem solving. Significant problems with structure/accuracy in expression. Team/Practical/ Professional skills not yet secure. Weak academic/ intellectual skills. Limited use of scholarly conventions
	20-29%	*Fails to achieve module outcome(s) related to this GLO. Qualifying mark not satisfied.*	Little evidence of knowledge of key issues/concepts/ethics in discipline. Largely descriptive, with little synthesis of existing scholarship and little evidence of argument. Little evidence of use of scholarly conventions.	Little evidence of research skills, use of learning resources and problem solving. Major problems with structure/ accuracy in expression. Team/Practical/Professional skills virtually absent. Very weak academic/intellectual skills. Little evidence of use of scholarly conventions
	10-19%		Inadequate knowledge of key issues/concepts/ethics in discipline. Wholly descriptive, with inadequate synthesis of existing scholarship and inadequate argument. Inadequate use of scholarly conventions.	Inadequate use of research skills, learning resources and problem solving. Major problems with structure/accuracy in expression. Team/Practical/Professional skills absent. Extremely weak academic/intellectual skills. Inadequate use of scholarly conventions
	1-9%		No evidence of knowledge of key issues/concepts/ethics in discipline. Incoherent and completely but poorly descriptive, with no evidence of synthesis of existing scholarship and no argument whatsoever. No evidence of use of scholarly conventions.	No evidence of use of research skills, learning resources and problem solving. Incoherent structure/accuracy in expression. Team/Practical/Professional skills non-existent. No evidence of academic/intellectual skills. No evidence of use of scholarly conventions
	0%		Awarded for: (i) non-submission; (ii) dangerous practice and; (iii) in situations where the student fails to address the assignment brief (eg: answers the wrong question) and/or related learning outcomes	

8. Attendance

Specify any minimum requirements. The following text is provided for you to use (with appropriate amendment, where necessary)

Attending all your classes is very important and one of the best ways to help you succeed in this module. In accordance with the Student Charter, you are expected to arrive on time and take an active part in all your timetabled classes. If you are unable to attend a class for a valid reason (eg: illness), please contact your Module Tutor *[or amend as appropriate].*

Anglia Ruskin will closely monitor the attendance of all students and will contact you by e-mail if you have been absent without notice for two weeks. Please remember to "tap-in" using your Ruskin card at every taught session. Continued absence can result in various consequences including the termination of your registration as you will be considered to have withdrawn from your studies.

International students who are non-EEA nationals and in possession of entry clearance/leave to remain as a student (Tier 4 student visa) are required to be in regular attendance at Anglia Ruskin. Failure to do so is considered to be a breach of national immigration regulations. Failure to do so will have serious implications for your immigration status in the UK. Anglia Ruskin, like all British Universities, is statutorily obliged to inform UK Visa & Immigration (Home Office) of significant unauthorised absences by any student visa holders.

9. Assessment Offences

The following text is provided for you to use (with appropriate amendment, where necessary)

As an academic community, we recognise that the principles of truth, honesty and mutual respect are central to the pursuit of knowledge. Behaviour that undermines those principles weakens the community, both individually and collectively, and diminishes our values. We are committed to ensuring that every student and member of staff is made aware of the responsibilities s/he bears in maintaining the highest standards of academic integrity and how those standards are protected.

You are reminded that any work that you submit must be your own. When you are preparing your work for submission, it is important that you understand the various academic conventions that you are expected to follow in order to make sure that you do not leave yourself open to accusations of plagiarism (eg: the correct use of referencing, citations, footnotes etc.) and that your work maintains its academic integrity.

Definitions of Assessment Offences

Plagiarism

Plagiarism is theft and occurs when you present someone else's work, words, images, ideas, opinions or discoveries, whether published or not, as your own. It is also when you take the artwork, images or computer-generated work of others, without properly acknowledging where this is from or you do this without their permission.

You can commit plagiarism in examinations, but it is most likely to happen in coursework, assignments, portfolios, essays, dissertations and so on.

Examples of plagiarism include:

- directly copying from written work, physical work, performances, recorded work or images, without saying where this is from;
- using information from the internet or electronic media (such as DVDs and CDs) which belongs to someone else, and presenting it as your own;
- rewording someone else's work, without referencing them; and

- handing in something for assessment which has been produced by another student or person.

It is important that you do not plagiarise – intentionally or unintentionally – because the work of others and their ideas are their own. There are benefits to producing original ideas in terms of awards, prizes, qualifications, reputation and so on. To use someone else's work, words, images, ideas or discoveries is a form of theft.

Collusion

Collusion is similar to plagiarism as it is an attempt to present another's work as your own. In plagiarism the original owner of the work is not aware you are using it, in collusion two or more people may be involved in trying to produce one piece of work to benefit one individual, or plagiarising another person's work.

Examples of collusion include:

- agreeing with others to cheat;
- getting someone else to produce part or all of your work;
- copying the work of another person (with their permission);
- submitting work from essay banks;
- paying someone to produce work for you; and
- allowing another student to copy your own work.

Many parts of university life need students to work together. Working as a team, as directed by your tutor, and producing group work is not collusion. Collusion only happens if you produce joint work to benefit of one or more person and try to deceive another (for example the assessor).

Cheating

Cheating is when someone aims to get unfair advantage over others.

Examples of cheating include:

- taking unauthorised material into the examination room;
- inventing results (including experiments, research, interviews and observations);
- handing your own previously graded work back in;
- getting an examination paper before it is released;
- behaving in a way that means other students perform poorly;
- pretending to be another student; and
- trying to bribe members of staff or examiners.

Help to Avoid Assessment Offences

Most of our students are honest and want to avoid committing assessment offences. We have a variety of resources, advice and guidance available to help make sure you can develop good academic skills. We will make sure that we make available consistent statements about what we expect. In accordance with our '***Academic Honesty Policy***', you will be able to do tutorials on being honest in your work from the library (http://anglia.libguides.com/GAP) and other central support services and faculties, and will be able to review your work for plagiarism using 'Turnitin®UK' (where appropriate), an online service for matched-text. You can get advice on how to use honestly the work of others in your own work from the library website (www.libweb.anglia.ac.uk/referencing/referencing.htm) and your lecturer and personal tutor.

Turnitin®UK will produce a report which clearly shows if passages in your work have been **matched with another source. Originality of assessment is an academic judgement and there is no generally acceptable upper or lower similarity score.** You may talk about the matched-text in the 'Turnitin®UK' report with a member of academic staff to see where you may need to improve your

academic practice. If you are not sure whether the way you are working meets our requirements, you should talk to your personal tutor, module tutor or other member of academic staff. They will be able to help you and tell you about other resources that will help you develop your academic skills.

Procedures for Assessment Offences

An assessment offence is the general term used to define cases where a student has tried to get unfair academic advantage in an assessment for himself or herself or another student.

In cases where the Module Leader suspects that the assignment submitted is not the work of the student, and may have been produced by another person, the Module Leader informs the Director of Studies of the suspicion of an assessment offence. In the process of considering the academic integrity of the work, the Director of Studies may invite the student to a meeting, with the Module Leader, to answer questions about the assignment.

We will fully investigate all cases of suspected assessment offences. If we prove that you have committed an assessment offence, an appropriate penalty will be imposed which, for the most serious offences, includes expulsion from Anglia Ruskin. For full details of our assessment offences policy and procedures, see Section 10 of the *Academic Regulations* at: www.anglia.ac.uk/academicregs.

10. Module Evaluation

During the second half of the delivery of this module, you will be asked to complete a module evaluation questionnaire to help us obtain your views on all aspects of the module.

This is an extremely important process which helps us to continue to improve the delivery of the module in the future and to respond to issues that you bring to our attention. The module report in section 11 of this module guide includes a section which comments on the feedback we received from other students who have studied this module previously.

Your questionnaire response is anonymous.

Please help us to help you and other students at Anglia Ruskin by completing the Module Evaluation survey. We very much value our students' views and it is very important to us that you provide feedback to help us make improvements.

In addition to the Module Evaluation process, you can send any comment on anything related to your experience at Anglia Ruskin to tellus@anglia.ac.uk at any time.

11. Report on Last Delivery of Module

Insert the Module Report Form for the last delivery of this module.

Appendix C Ethics approval 29 May 2015

From: Jimenez Bescos, Carlos
To: Vohmann, Barbara; Coday, Alan
Subject: Re: Ethics
Date: 29 May 2015 11:11:07

Hi Barbara,

Your ethic application has been approved by DREP for registration with FREP as category 2.
Laurie Gill will inform you officially in due course.

Regards. Carlos

Dr Carlos Jimenez-Bescos
BSc PGCE PhD CEng MCIBSE SFHEA MIET CEPH
Deputy Director of the Professional Doctorate (Sc and Tech)
Certified European Passivhaus Designer

Anglia Ruskin University
Bishop Hall Lane
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Appendix D Ethics approval 7 November 2016

From: Gill, Laurie
To: Vohmann, Barbara
Cc: Crabtree, Peter
Subject: Ethics application approved
Date: 08 November 2016 15:33:49

Dear Barbara,

I can confirm that your ethics application re: Undergraduates' development as effective built environment practitioners has been approved by the FREP. Under the terms of Anglia Ruskin University's Research Ethics Policy approval is for a period of 3 years from 7th November 2016.

Kind regards,

Laurie Gill.
Departmental Administrator for Engineering and the Built Environment

Tel: 0845 196 3961/ 01245 68 3961
Fax: 0845 196 4524
Email: laurie.gill@anglia.ac.uk

Appendix E Participant Information Sheet

ARU Participant Information Sheet

PARTICIPANT INFORMATION SHEET GUIDANCE

Section A: The Research Project

Title of project: Undergraduates' development as effective built environment practitioners. It also draws comparison with different departments.

1. **Brief summary of research.**
The study looks at links between the assessment, feedback and professional practice aspect of undergraduate study in this Department.

2. **Purpose of the study**
This study is for my DProf in the Built Environment at Anglia Ruskin University

3. **Name of your Supervisor** Dr P Crabtree

4. **Why have I been asked to participate?**
Because you are an expert in the area under study, and are thus able to contribute valuable insights to the issues under investigation.

5. **How many people will be asked to participate?** The number of people asked to participate in total is expected to be fewer than 200. This includes some who may participate through face-to-face discussion and those who participate though completing written questionnaires.

6. **What are the likely benefits of taking part?**
It is unlikely that there will be any direct benefits to participants. The study may yield some useful information, and you may find it interesting to be involved with such a project. You may also like to be involved with a study that intends to change practice within the Department.

7. **Can I refuse to take part?**
Yes, you can refuse to take part without giving a reason. Under no circumstances should you as participant feel coerced into taking part.

8. **Has the study got ethical approval?**
The study has ethical approval from an ethics committee at Anglia Ruskin University.

9. **Has the organisation where you are carrying out the research given permission?**
Anglia Ruskin University is happy for this research to take place but this only gives consent to ask people or groups of people if they would wish to participate; it does not suggest that anyone should be expected to participate.

10. **What will happen to the results of the study?**
This research will be written up for your thesis. There may also be some published work in journals and/or presented at conferences.

11. **Contact for further information**

Section B: Your Participation in the Research Project

1. **What will I be asked to do?**
Be involved with focus groups or interviews.

2. **Will my participation in the study be kept confidential?**
Yes. Participants' identities will not be recorded at the point of gathering data. This means that they cannot have their identity divulged, it will remain confidential, or to be accurate, not recorded. My supervisor will have access to my data, although details of the participants will remain confidential as this will not have been recorded. It will not be possible to identify anyone from the work produced from this data gathering.

The results will be written up in anonymised format.

3. Use of quotes. Quotes may be used on occasion to illustrate a commonly made point. As such it is considered highly unlikely that anyone could be identified

4. Use of recording equipment - focus groups and interviews are to be recorded. Data from these is to be kept secure in line with university policy. After completion of the project this data is to be destroyed.

5. **Will I be reimbursed travel expenses?**
It is expected that participants will not incur any travel expenses.

6. No incentives are to be offered to participants.

7. **Are there any possible disadvantages or risks to taking part?**
Possible disadvantages or risks includes the risk of boredom, fatigue or participants becoming distressed, as well as risks to confidentiality (e.g. the chance of participants being identified from dissemination), although these are considered unlikely. Rest breaks will be offered to ensure your safety or it may be stopped completely if appropriate. Agreement to participate in the study does not affect participant's legal rights.

8. **Whether I can withdraw at any time, and how**.
Participants can withdraw from the study at any time and without giving a reason. If you do not feel comfortable telling the researcher directly that they would no longer like to take part in your research you could take an alternative option such as email if this is practicable. However you may still be happy for your data to be used or you may ask that your data is not used. The last practicable time to withdraw your data is two days after the focus group or interview. Please note that you do not have to answer any questionnaire or interview questions you do not wish to.

9. **Whether there are any special precautions you must take before, during or after taking part in the study.**
There is nothing you need to do in advance of your participation.

10. **What will happen to any data that are collected from you?**
Data will be securely held and state this on your participant information sheet. It will be destroyed after the thesis is completed. Personal identifiable information (e.g. consent forms) will be kept separately from the data.

11. You may ask to read a transcript of your interview if you wish.

12. Summary of research findings. A summary of the findings will be made available to participants following the study to read if you wish. Please contact the researcher to arrange this.

13. **Contact details for complaints.**

If participants have any complaints about the study, they should be encouraged to speak to you or your Supervisor in the first instance. They should also, however, be given access to details about Anglia Ruskin University's complaints procedure.

Email address: complaints@anglia.ac.uk

Postal address: Office of the Secretary and Clerk, Anglia Ruskin University, Bishop Hall Lane, Chelmsford, Essex, CM1 1SQ.

Version control

Your participant information sheet, consent form and other documents should have a version number and date. This is in order that should any changes be required by the ethics committee, it is clear which documentation has ethical approval.

PARTICIPANTS SHOULD BE GIVEN A COPY OF THIS TO KEEP,
TOGETHER WITH A COPY OF THE CONSENT FORM.

Appendix F Participant Consent Form

ARU Participant Consent Form

PARTICIPANT CONSENT FORM

NAME OF PARTICIPANT:

Title of the project: Enhancing assessment feedback to promote undergraduate learning in built environment disciplines

Main investigator and contact details: Barbara Vohmann

Member of the research team: Barbara Vohmann.

1. I agree to take part in the above research. I have read the Participant Information Sheet for the study. I understand what my role will be in this research, and all my questions have been answered to my satisfaction.

2. I understand that I am free to withdraw from the research at any time, for any reason and without prejudice.

3. I have been informed that the confidentiality of the information I provide will be safeguarded.

4. I am free to ask any questions at any time before and during the study.

5. I have been provided with a copy of this form and the Participant Information Sheet.

Data Protection: I agree to the University[5] processing personal data which I have supplied. I agree to the processing of such data for any purposes connected with the Research Project as outlined to me*

[5] "The University" includes Anglia Ruskin University and its partner colleges

Name of participant
(print)…….Signed……..….Date……

YOU WILL BE GIVEN A COPY OF THIS FORM TO KEEP

If you wish to withdraw from the research, please complete the form below and return to the main investigator named above.

Title of Project: Enhancing assessment feedback to promote undergraduate learning in built environment disciplines

I WISH TO WITHDRAW FROM THIS STUDY

Signed: _____ Date: _____

Appendix G Focus group and interview questions

Researcher's prompts

Thank participants for participating, explain they could read and revise transcripts if they wished and that they are the experts not the researcher.

Remind focus group participants the goal is to share views not necessarily agree.

Recording will be deleted as ultimately will the transcription.

Advise participants when the recorder is about to be turned on.

Areas to probe:

Assessment design and the real world.

Feedback practicality and usefulness.

Links with the real world.

Use made of feedback?

Student focus group questions

Questions for the student focus groups were as follows:

1. When you do coursework assessment what do you focus on most?
2. Does the assessment help you develop your professional practice skills?
3. How does your assessment help you learn ready for professional practice?
4. Do you understand how you will use your university learning in professional practice?
5. Do you know what employability skills are?
6. Do you think you are developing employability skills through your assessment?
7. What do you consider assessment feedback to be? Probe whether there was a match or a gap, and if so what the gap was, between students and tutors perceptions of assessment feedback.
8. How do you get feedback? Probe how or whether students perceived that they received feedback.
9. What do you do with the feedback you receive? Probe the extent to which students used, or at least thought they used, feedback.
10. Does the feedback you receive help develop your professional practice skills? Probe the extent to which feedback was perceived as beneficial for academic learning and also students' development as effective practitioners.
11. Do you use feedback from one module in another?

Interview questions for tutors

Researcher's prompts

Thank participants for participating, explain they could read and revise transcripts if they wished and that they are the experts not the researcher.

Remind focus group participants the goal is to share views not necessarily agree.

Recording will be deleted as ultimately will the transcription.

Advise participants when the recorder is about to be turned on.

1. What influences you when you design assessment especially coursework and why? Probe what shaped tutors thinking, as assessment design was considered likely to underpin the totality of module experience, particularly as students tend to focus on assessment.
2. Do you think you constructively align your module delivery? Probe the extent to which tutors were thinking about links between the components of module delivery, and evaluate the extent to which tutors considered professional practice in their module.
3. What do you focus on most in assessment feedback? Probe what tutors considered most important in feedback, and identify whether professional practice was included in tutors thinking.
4. What do you consider assessment feedback to be? Probe tutors perceptions of feedback.
5. When do you give feedback? Probe what tutors did. This links with the previous question, as it would allow for differences between what tutors perceive as feedback and what they do to be explored.
6. Do you think students recognise all the types of feedback they receive? Probe tutors perceptions of students understanding of feedback.
7. How do you link your module with professional practice? Probe how tutors developed this aspect of their module delivery.
8. Do you link feedback with students' development of their transferable skills? Probe the extent of links with development of students' transferable skills that tutors perceived they made.
9. What do you think is the most effective teaching device that you use to help students' learning? Probe those techniques that tutors perceive as effective pedagogic devices, and which may or may not include feedback as significant.

Interview questions for employers

Researcher's prompts

Thank participants for participating, explain they could read and revise transcripts if they wished and that they are the experts not the researcher.

Remind focus group participants the goal is to share views not necessarily agree.

Recording will be deleted as ultimately will the transcription.

Advise participants when the recorder is about to be turned on.

1. Do you think that undergraduates link university work with professional practice? Probe employers' perspectives of the university – professional practice relationship.
2. Do you think that university courses adequately prepare students for professional practice? Probe whether employers feel that courses meet the needs of industry.
3. Do trainees understand the value of employability skills? Probe employers' perspectives of employees' recognition of these valuable, yet subtle, skills.
4. Do you feel that students adequately develop their employability skills throughout their course? Probe employers' perceptions of students' development.
5. Do you detect a degree course changing students as practitioners? Probe what employers feel degree achieves in respect of their employees development.
6. Are you aware of your trainee using feedback from tutors to help support their development as practitioners? Probe the education – employment link.
7. Are you aware of your employee becoming more effective as a consequence of their learning, including their university assessment?
8. Do you feel that undergraduate courses develop students as effectively as possible? Probe what employers feel is achieved.
9. If you could change one thing about university courses, what would it be? Open ended question to establish what employers would value.

Appendix H Preliminary meetings

Item reference	Date	Data	Gathered as	Description of item	Location	Format or duration
Preliminary meeting with optometry tutor	15/8/2016	Informal meeting	Researcher's notes	Meeting with optometry tutor, view facilities and equipment	Office, classroom, eye clinic	55 minutes approximately
Preliminary meeting with forensic science tutor	15/8/2016	Informal meeting	Researcher's notes	Meeting with forensic science tutor, view facilities and equipment	Office, forensic science laboratory, crime scene room	1 ½ hours approximately

Appendix I Focus groups

Item reference	Date	Data	Gathered as	Description of item	Location	Format or duration
Initial study	21/10/2015	Focus group	Audio recording MP3 format	4 built environment students	Classroom	41 minutes 25 seconds
Focus group A	14/7/2016	Meeting / focus group	Audio recording MP3 format	6 built environment tutors	Classroom	9 minutes 12 seconds
Focus group B	18/7/2016	Meeting / focus group	Audio recording MP3 format	5 built environment tutors	Classroom	19 minutes 24 seconds
Focus group C	17/11/2016	Focus group	Audio recording MP3 format	2 built environment students	Classroom	13 minutes 07 seconds
Focus group D	1/12/2016	Focus group	Audio recording MP3 format	5 built environment students	Classroom	32 minutes 23 seconds
Focus group E	6/12/2016	Focus group	Audio recording MP3 format	3 built environment students	Classroom	1 hour 0 minutes 29 seconds
Focus group F	8/12/2016	Focus group	Audio recording MP3 format	4 built environment students	Classroom	25 minutes 17 seconds
Focus group G	9/2/2017	Focus group	Audio recording MP3 format	7 built environment students	Classroom	36 minutes 17 seconds

Focus group H	9/2/2017	Focus group	Audio recording MP3 format	8 built environment students	Classroom	15 minutes 26 seconds
Focus group I	6/4/2017	Focus group	Audio recording MP3 format	8 built environment students	Classroom	11 minutes 39 seconds
Focus group J	27/4/2017	Focus group	Audio recording MP3 format	7 built environment students	Classroom	10 minutes 19 seconds
Focus group K	27/4/2017	Focus group	Audio recording MP3 format	7 built environment students	Classroom	23 minutes 26 seconds
Focus group L	27/4/2017	Focus group	Audio recording MP3 format	5 built environment students	Classroom	2 minutes 49 seconds
Focus group M	12/10/2017	Focus group	Audio recording MP3 format	3 Optometry students	Classroom	3 minutes 29 seconds
Focus group N	12/10/2017	Focus group	Audio recording MP3 format	3 Optometry students	Classroom	19 minutes 00 seconds
Focus group O	23/10/2017	Focus group	Audio recording MP3 format	4 Optometry students	Classroom	9 minutes 11 seconds
Focus group P	23/10/2017	Focus group	Audio recording MP3 format	4 Optometry students	Classroom	3 minutes 17 seconds
Focus group Q	21/11/2017	Focus group	Audio recording MP3 format	8 Forensic science students	Classroom	13 minutes 29 seconds

Focus group R	21/11/2017	Focus group	Audio recording MP3 format	6 Forensic science students	Classroom	1 minute 24 seconds
Focus group S	21/11/2017	Focus group	Audio recording MP3 format	7 Forensic science students	Classroom	23 minutes 57 seconds
Focus group T	29/1/2018	Focus group	Audio recording MP3 format	7 built environment students	Classroom	24 minutes 06 seconds

Appendix J Interviews

Item reference	Date	Data	Gathered as	Description of item	Location	Format or duration
Interview BE 1	30/11/2015	Interview	Audio recording MP3 format	Built environment tutor	University meeting room	9 minutes 22 seconds
Interview BE 2	7/12/2015	Interview	Audio recording MP3 format	Built environment tutor	University meeting room	19 minutes 33 seconds
Interview BE 3	7/12/2015	Interview	Audio recording MP3 format	Built environment tutor	University meeting room	26 minutes 40 seconds
Interview BE 4	10/12/2015	Interview	Audio recording MP3 format	Built environment tutor	University meeting room	13 minutes 56 seconds
Interview BE 5	28/11/2016	Interview	Audio recording MP3 format	Built environment tutor	University meeting room	10 minutes 20 seconds

Interview BE 6	1/12/2016	Interview	Audio recording MP3 format	Built environment tutor	University meeting room	23 minutes 24 seconds
Practitioner interview 1	7/12/2016	Interview	Audio recording MP3 format	Private practice employer, manager	Classroom	7 minutes 36 seconds
Interview Opt 1	14/12/2016	Interview	Audio recording MP3 format	Optometry tutor	University meeting room	40 minutes 15 seconds
Interview Opt 2	16/12/2016	Interview	Audio recording MP3 format	Optometry tutor	University meeting room	32 minutes 16 seconds
Interview Opt 3	16/12/2016	Interview	Audio recording MP3 format	Optometry tutor	University meeting room	31 minutes 02 seconds
Interview Opt 4	10/1/2017	Interview	Audio recording MP3 format	Optometry tutor	University meeting room	41 minutes 31 seconds
Interview BE 7	18/1/2017	Interview	Audio recording MP3 format	Built environment tutor	University meeting room	24 minutes 49 seconds

Interview FS 1	26/1/2017	Interview	Audio recording MP3 format	Forensic science tutor	University meeting room	26 minutes 08 seconds
Interview FS 2	14/2/2017	Interview	Audio recording MP3 format	Forensic science tutor	University meeting room	37 minutes 11 seconds
Interview FS 3	14/2/2017	Interview	Audio recording MP3 format	Forensic science tutor	University meeting room	23 minutes 51 seconds
Interview FS 4	6/3/2017	Interview	Audio recording MP3 format	Forensic science tutor	University meeting room	34 minutes 08 seconds
Interview with philosophy course tutor	26/7/2017	Interview	Audio recording MP3 format	Philosophy tutor	Philosophy tutor's office	12 minutes 56 seconds
Practitioner interview 2	15/8/2017	Interview	Audio recording MP3 format	Private practice employer, partner	Employer's office	5 minutes 30 seconds
Practitioner interview 3	25/8/2017	Interview	Audio recording MP3 format	Private practice employer, partner	University meeting room	24 minutes 18 seconds

Practitioner interview 4	18/10/2017	Interview	Audio recording MP3 format	Public sector employer, senior manager	Employer's office	13 minutes 27 seconds
Practitioner interview 5	18/10/2017	Interview	Audio recording MP3 format	Public sector employer, board member	University meeting room	16 minutes 24 seconds
Practitioner interview 6	16/11/2017	Interview	Audio recording MP3 format	Private practice employer, senior manager	Employer's meeting room	13 minutes 45 seconds
Interview BE 8	17/11/2017	Interview	Audio recording MP3 format	Built environment tutor	University meeting room	32 Minutes 02 seconds
Interview BE 9	20/11/2017	Interview	Audio recording MP3 format	Built environment tutor	University meeting room	46 minutes 22 seconds
Interview BE 10	20/11/2017	Interview	Audio recording MP3 format	Built environment tutor	University meeting room	15 minutes 46 seconds

Interview BE 11	20/11/2017	Interview	Audio recording MP3 format	Built environment tutor	University meeting room	30 minutes 24 seconds
Interview BE 12	20/11/2017	Interview	Audio recording MP3 format	Built environment tutor	University meeting room	14 minutes 00 seconds
Interview BE 13	27/11/2017	Interview	Audio recording MP3 format	Built environment tutor	University meeting room	1 hour 02 minutes 01 second
Interview BE 14	5/12/2017	Interview	Audio recording MP3 format	Built environment tutor	University meeting room	36 minutes 23 seconds
Interview BE 15	5/12/2017	Interview	Audio recording MP3 format	Built environment tutor	University meeting room	31 minutes 31 seconds

Appendix K PSRB accreditation information

Item reference	Date	Data	Gathered as	Description of item	Location	Format or duration
ARB	24/11/2016	Documentation	Hardcopy	Accreditation documentation	Online	Internet-based
CIAT	24/11/2016	Documentation	Hardcopy	Accreditation documentation	Online	Internet-based
CIOB	24/11/2016	Documentation	Hardcopy	Accreditation documentation	Online	Internet-based
JMB	24/11/2016	Documentation	Hardcopy	Accreditation documentation	Online	Internet-based
RICS	24/11/2016	Documentation	Hardcopy	Accreditation documentation	Online	Internet-based
CSFS	24/11/2016	Documentation	Hardcopy	Accreditation documentation	Online	Internet-based
GOC	24/11/2016	Documentation	Hardcopy	Accreditation documentation	Online	Internet-based

Appendix L CSFs examined

Item reference	Date	Data	Gathered as	Description of item	Location	Format or duration
BA (Hons) Architecture	9/9/2015	Document	Hardcopy	Validated Course Specification Form	University shared document	PDF document
BSc (Hons) Architectural technology	9/9/2015	Document	Hardcopy	Validated Course Specification Form	University shared document	PDF document
FdSc Construction	9/9/2015	Document	Hardcopy	Validated Course Specification Form	University shared document	PDF document
BSc (Hons) Construction management	9/9/2015	Document	Hardcopy	Validated Course Specification Form	University shared document	PDF document
FdSc Civil Engineering	9/9/2015	Document	Hardcopy	Validated Course Specification Form	University shared document	PDF document

BSc (Hons) Civil Engineering	9/9/2015	Document	Hardcopy	Validated Course Specification Form	University shared document	PDF document
BEng (Hons) Civil Engineering	9/9/2015	Document	Hardcopy	Validated Course Specification Form	University shared document	PDF document
BSc (Hons) Building surveying	9/9/2015	Document	Hardcopy	Validated Course Specification Form	University shared document	PDF document
BSc (Hons) Quantity surveying	9/9/2015	Document	Hardcopy	Validated Course Specification Form	University shared document	PDF document
BSc (Hons) Real Estate Surveying	9/9/2015	Document	Hardcopy	Validated Course Specification Form	University shared document	PDF document
BSc (Hons) Forensic science	9/9/2015	Document	Hardcopy	Validated Course Specification Form	University shared document	PDF document

BOptom (Hons) Optometry	9/9/2015	Document	Hardcopy	Validated Course Specification Form	University shared document	PDF document

Appendix M Module guides by course

Item reference	Date	Data	Gathered as	Description of item	Location	Format or duration
BA (Hons) Architecture	Semester 1, 2015/16	Document	Hardcopy	Module information, level 4 module	University shared document	Word document
BA (Hons) Architecture	Semester 1, 2015/16	Document	Hardcopy	Module information, level 5 module	University shared document	Word document
BA (Hons) Architecture	Semester 1, 2015/16	Document	Hardcopy	Module information, level 6 module	University shared document	Word document
BSc (Hons) Architectural technology	Semester 1, 2015/16	Document	Hardcopy	Module information, level 4 module	University shared document	PDF document
BSc (Hons) Architectural technology	Semester 2, 2015/16	Document	Hardcopy	Module information, level 5 module	University shared document	Word document

BSc (Hons) Architectural technology	Semester 2, 2015/16	Document	Hardcopy	Module information, level 6 module	University shared document	Word document
FdSc Construction	Semester 1, 2015/16	Document	Hardcopy	Module information, level 4 module	University shared document	Word document
FdSc Construction	Semester 2, 2015/16	Document	Hardcopy	Module information, level 5 module	University shared document	Word document
BSc (Hons) Construction management	Semester 1, 2015/16	Document	Hardcopy	Module information, level 4 module	University shared document	Word document
BSc (Hons) Construction management	Semester 2, 2015/16	Document	Hardcopy	Module information, level 5 module	University shared document	PDF document
BSc (Hons) Construction management	Semester 1, 2015/16	Document	Hardcopy	Module information, level 6 module	University shared document	Word document

FdSc civil Engineering	Semester 1, 2015/16	Document	Hardcopy	Module information, level 4 module	University shared document	Word document
FdSc Civil Engineering	Semester 2, 2015/16	Document	Hardcopy	Module information, level 5 module	University shared document	PDF document
BSc Civil engineering	Semester 1, 2015/16	Document	Hardcopy	Module information, level 4 module	University shared document	PDF document
BSc Civil engineering	Semester 2, 2015/16	Document	Hardcopy	Module information, level 5 module	University shared document	Word document
BSc Civil engineering	Semester 1, 2015/16	Document	Hardcopy	Module information, level 6 module	University shared document	PDF document
BEng Civil Engineering	Semester 1, 2015/16	Document	Hardcopy	Module information, level 4 module	University shared document	Word document

BEng Civil Engineering	Semester 1, 2015/16	Document	Hardcopy	Module information, level 5 module	University shared document	Word document
BEng Civil Engineering	Semester 1, 2015/16	Document	Hardcopy	Module information, level 6 module	University shared document	PDF document
BSc (Hons) Building surveying	Semester 1, 2015/16	Document	Hardcopy	Module information, level 4 module	University shared document	PDF document
BSc (Hons) Building surveying	Semester 1, 2015/16	Document	Hardcopy	Module information, level 5 module	University shared document	Word document
BSc (Hons) Building surveying	Semester 1, 2015/16	Document	Hardcopy	Module information, level 6 module	University shared document	PDF document
BSc (Hons) Real Estate Management	Semester 2, 2015/16	Document	Hardcopy	Module information, level 4 module	University shared document	Word document

BSc (Hons) Real Estate Management	Semester 1, 2015/16	Document	Hardcopy	Module information, level 5 module	University shared document	Word document
BSc (Hons) Real Estate Management	Semester 1, 2015/16	Document	Hardcopy	Module information, level 6 module	University shared document	Word document
BSc (Hons) Quantity surveying	Semester 2, 2015/16	Document	Hardcopy	Module information, level 4 module	University shared document	Word document
BSc (Hons) Quantity surveying	Semester 2, 2015/16	Document	Hardcopy	Module information, level 5 module	University shared document	PDF document
BSc (Hons) Quantity surveying	Semester 1, 2015/16	Document	Hardcopy	Module information, level 6 module	University shared document	Word document
BOptom (Hons) Optometry	Semester 2, 2015/16	Document	Hardcopy	Module information, level 4 module	University shared document	PDF document

BOptom (Hons) Optometry	Semester 2, 2015/16	Document	Hardcopy	Module information, level 5 module	University shared document	PDF document
BOptom (Hons) Optometry	Semester 2, 2015/16	Document	Hardcopy	Module information, level 6 module	University shared document	PDF document
BSc (Hons) Forensic science	Semester 2, 2015/16	Document	Hardcopy	Module information, level 4 module	University shared document	PDF document
BSc (Hons) Forensic science	Semester 2, 2015/16	Document	Hardcopy	Module information, level 5 module	University shared document	PDF document
BSc (Hons) Forensic science	Semester 2, 2015/16	Document	Hardcopy	Module information, level 6 module	University shared document	PDF document

Appendix N Written feedback by course area

Item reference	Date	Data	Gathered as	Description of item	Location	Format or duration
Surveying	Semester 1, 2015/16	Document	Hardcopy	Written feedback level 6	Assessment meeting archive	Word document, 1 item
Surveying	Semester 1, 2015/16	Document	Hardcopy	Written feedback level 5	Assessment meeting archive	Word documents, 5 items
Civil engineering	Semester 1, 2015/16	Document	Hardcopy	Written feedback level 5	Assessment meeting archive	Word documents, 8 items
Surveying	Semester 1, 2015/16	Document	Hardcopy	Written feedback level 4	Assessment meeting archive	Word documents, 6 items
Architecture, civil engineering and construction	Semester 1, 2015/16	Document	Hardcopy	Written feedback level 4	Assessment meeting archive	Word documents, 12 items

Construction management	Semester 1, 2015/16	Document	Hardcopy	Written feedback level 5	Assessment meeting archive	Word document, 1 item
Civil engineering, construction management	Semester 1, 2015/16	Document	Hardcopy	Written feedback level 4	Assessment meeting archive	Word documents, 6 items
Architecture, architectural technology	Semester 1, 2015/16	Document	Hardcopy	Written feedback level 5	Assessment meeting archive	Word documents, 5 items
Civil engineering, construction management	Semester 1, 2015/16	Document	Hardcopy	Written feedback level 5	Assessment meeting archive	Word documents, 8 items
Forensic science	Semester 1, 2015/16	Document	Hardcopy	Written feedback level 4	Assessment meeting archive	Word documents, 2 items
Forensic science	Semester 1, 2015/16	Document	Hardcopy	Written feedback level 5	Assessment meeting archive	Word documents, 10 items

Forensic science	Semester 2, 2015/16	Document	Hardcopy	Written feedback level 6	Assessment meeting archive	Word documents, 15 items
Optometry	Semester 1, 2015/16	Document	Hardcopy	Written feedback level 5	Provided by tutor after assessment meeting	Word documents, 8 items
Optometry	Semester 1, 2015/16	Document	Hardcopy	Written feedback level 6	Provided by tutor after assessment meeting	Word documents, 9 items

Appendix O Assessment briefs

Item reference	Date	Data	Gathered as	Description of item	Location	Format or duration
Practice-based assessment brief	Semester 1, 2015/16	Document	Hardcopy	Assessment information, level 6 module	University shared document	PDF document
Construction economics assessment brief	Semester 2, 2015/16	Document	Hardcopy	Assessment information, level 4 module	University shared document	Word document
Practice-based assessment brief	Semester 1, 2016/17	Document	Hardcopy	Assessment information, level 6 module	University shared document	PDF document
Construction economics assessment brief	Semester 2, 2016/17	Document	Hardcopy	Assessment information, level 4 module	University shared document	Word document

Appendix P Dissertation feedback

Item reference	Date	Data	Gathered as	Description of item	Location	Format or duration
Dissertation feedback built environment	Semester 2, 2016/17	Document	Hardcopy	Written feedback	Assessment meeting archive	Word documents, 9 items
Dissertation feedback optometry	Semester 2, 2016/17	Document	Hardcopy	Written feedback	Provided by course director	Word documents, 9 items
Dissertation feedback forensic science	Semester 2, 2016/17	Document	Hardcopy	Written feedback	Assessment meeting archive	Word documents, 8 items

Appendix Q Feedback from modified module

Item reference	Date	Data	Gathered as	Description of item	Location	Format or duration
Feedback on modified assessment	Semester 1, 2016/17	Document	Hardcopy	Written feedback	Provided by module tutor	Word document, 35 items

Appendix R Illustrative examples of raw data

Module guide raw data

Level 4 module delivered on all surveying and construction undergraduate courses.

Reflective PDP Report **–** The first stage of the Anglia Ruskin Personal Development Planning (PDP) process. The process, and the forms on which the results are to be recorded, are specified on the ARU website. It is important that you follow this guidance.

Level 4 module delivered on civil engineering undergraduate courses.

Two reports, Part 1 and Part 2 are to be submitted.

Part 1 contributes 30% and Part 2 70% of the marks for the module.

Level 4 module on the forensic science course.

Demonstrate a good working knowledge of the nature and significance of a range of materials likely to be encountered as trace evidence at a crime scene.

Level 4 module delivered on the undergraduate optometry course.

The Practical station exam format:

- there will be 5 stations:
  - Ophthalmoscopy
  - Retinoscopy
  - Case History
  - Subjective Refraction - X cylinder
  - Ocular Motor balance
- Each station will be 10 minutes long
- Both your clinical and theoretical knowledge will be tested

Level 5 module delivered on architecture and architectural technology courses.

Individual CAD submission of a building project produced in Revit. The building to be modelled in Revit is to be agreed with the module tutor.

Level 5 module delivered on all undergraduate courses in the Department except civil engineering.

This is an investigation into the energy consumption and carbon dioxide emissions of a domestic building.

Level 5 module delivered on construction management and construction courses.

Produce a report analysing how your chosen organisation manages its resources and operates within the construction industry.

Level 5 module delivered on quantity surveying undergraduates.

Problem-solving activities associated with Quantity Surveying Practice 1 module are related to a hypothetical project as detailed below.

Level 5 module delivered on the optometry course.

Show an effective understanding of how ocular & systemic disease may present to the optometrist and be able to demonstrate a basic understanding of the optometric & medical management of ocular disease & abnormality.

Level 6 module delivered on architecture and architectural technology courses.

As part of the ongoing improvement in digital communications and requirements of clients/local authorities in the built environment, students will be required to provide a digital copy of all assignments in pdf format. The digital information is to be uploaded/provided on CD/USB memory stick with each assignment, bound into the reports/fixed on boards in plastic self-adhesive cover.

The selection of a client and site, preparation of the Project Brief and analysis of place with initial conceptual designs provides 30% of the overall mark (focus of Semester 2 – Academic Year 2015/16),

Level 6 module on the forensic science course.

Critically evaluate the evidence types that can be used and the alpha numeric data generated by drug profiling

Practical sessions, practical report, lectures and exam

Level 6 module delivered on the optometry course.

3 hour written paper

Focus group extracts

Built environment focus group

Researcher: Thank you. What do you do with the feedback you receive?

Participant 3: I can only speak from-- I personally take it on board and try and implement that in the next module. If the comment's regarding formatting or references or the way that you talk, i.e. different person, etcetera who-- And let's call you out on a search subject. Personally, I look at it and try and incorporate that in the next module.

Researcher: Okay, is that what you do?

Participant 1: Yes, I try to.

Participant 3: I think you have to, because I think as a personal thing, you always want to try to better yourself.

Optometry focus group

Researcher: That's lovely. Has anyone got any final comments, or observations about assessment or feedback, what really works -- what really works for you, more than anything else?

Participant 1: I just really like how they give us a practical times here, and also our supervisors aren't actually our lecturers, as such but they're supervisors from outside, so some of them might be local opticians. So, they all have different expertise, and they all provide different, different feedbacks. So, different supervisors look at different things, and they focus more on different things. So, some supervisors might actually focus more on communication, or one supervisor might be polishing up more on technique, or something. So I think it's that, it's just having the variety of supervisors every week, not seeing the same person, and just doing it one way. They tell you, "This is one way of doing it," or "This is another way, you could do the same thing, but it's up to you what do you find better."

Participant 2: Yeah, just sort of like pick which one.

Forensic science focus group

Interviewer: Does the assessment that you do help develop your professional practice skills?

Participant 1: It depends on the assessment. Exams test our knowledge but don't really help us practically, with different modules test our practical skills which will help us in the professional workplace.

Interviewer: Okay, when you do exams do they test different kinds of knowledge from the other stuff, the other kind of assessment that you do?

Participant 2: It's similar but in different ways, like they could test our practical stuff like when we actually do it but if they test the way it's just written cause some people could find it hard to put down into words while it can quite easily show, physically.

CSFs - extracts of documentation

BEng Civil Engineering CSF

The aim of the course is to produce a graduate engineer equipped to satisfy the needs of the Civil Engineering Industry in the planning, design, construction and maintenance of civil engineering facilities and to provide the opportunity for students to develop the intellectual and imaginative abilities, with respect to engineering practice, required to pursue a professional career in Civil Engineering.

Quantity surveying CSF

The aims of the award reflect the professional and expanding role of Quantity Surveyors in the financial management of construction projects from inception through design, construction process, maintenance of buildings to ultimate disposal. The Quantity Surveyor will be required to advise clients on the economic feasibility of projects, procurement options, contractual arrangements, legal constraints and costs of construction, fitting out as well as maintenance, running and disposal costs once a project is complete.

PSRB extracts of accreditation documentation

ARB accreditation documentation

GC1 The graduate will have the ability to:
1 prepare and present building design projects of diverse scale, complexity, and type in a variety of contexts, using a range of media, and in response to a brief;
2 understand the constructional and structural systems, the environmental strategies and the regulatory requirements that apply to the design and construction of a comprehensive design project;

CIOB accreditation documentation

Global Issues
Demonstrate an understanding of:
• social sustainability • economic sustainability • environmental sustainability For example – Brundtland Report, environmental impact, low and zero carbon, energy generation.

General Outcomes

The course should be designed to enable the student to:

1. demonstrate an understanding of relevant legislation, regulation, standards and codes of practice for all aspects of an investigation, including issues relating to conflict of interest, data protection, confidentiality and legal privilege;

2. record observations in the form of notes in a logical, comprehensive and contemporaneous manner;

3. demonstrate an understanding of the investigative process and the requirements of continuity of evidence;

Built environment feedback

Both building plan and structural layout were well presented with the design scenario and task well defined. Both drawings should have been numbered and referred to in your report.

Overall your assignment has shown a reasonable understanding of the various sources of cost data that a contractor's estimator would use in order to produce an accurate estimate of cost.

Forensic science feedback

Please see detailed feedback on your script. Colour test method- which reagents were used? Which drugs were tested? What was monitored?

Appendix S Illustrative examples of data analysis, themes and codes

Focus group of built environment students.

What do you consider assessment feedback to be?	**Participant 1:** Assessment feedback is referring back to the **marking criteria** and trying to compare **whether you've hit those criteria** and how thoroughly.	feedback referring to mark criteria, achieving the goal	feedback & criteria
	Participant 1: Areas you've done well in and **areas you haven't** done so well on, just need to **improve** on in the future.	where you do well and less so, improve, future	improvement
	Participant 1: But also **validates the mark** you've been given.	justify marks	marks
	Participant 1: It **verifies** that what you're doing is **correct** and	verifies what you do is correct	work being correct
	Participant 1: whether you need to **improve** on certain aspects, so it might act to **improve** your **future** assignments	future assignments	improvement
	Participant 1: but also as a statement for the existing one too.	improve for the future	feedback

Focus group of built environment students.

Would anyone like to expand on that?	Participant 1: I don't think ... I think there's **some areas in the modules** where they, it **doesn't actually relate** to what you would actually do in practice.	some modules do not relate to the real world	authenticity to professional practice
	Participant 1: It is too, too much, or **it's too close to the academic side of things.**	too academic	relevance
	Participant 1: There's **scope there for making sure that they follow processes that is actually taken** on by the **outside companies.**	scope to use companies processes	authenticity to professional practice
	Participant 2: **I don't think there's a close enough link to outside companies.**	not enough links to outside companies	links with industry
	Participant 2: **We've had a few people come in and talk to us about their companies**	a few people have talked to students about their companies	industry
	Participant 2: **I don't think that has actually bridged the gap enough.**	not bridged the theory/practice gap	theory-practice gap

Focus group of optometry students.

So how does all this theory and clinic stuff tie in with your assessment?	Participant 3: Main **assessment** for our **practices,** OSCEs, that we have.	main assessment for OSCEs practice	assessment = practice
	Participant 3: So that's like **doing** different things, we have like X amount of **stations.**	stations to do	practical assessment
	Participant 3: So it's each **skill** you're being **assessed** on, and you have **five minutes** per station.	skills assessed, time	skills assessed, time
	Participant 3: And in your sight test routine that's a **part of your routine** basically.	assessment routine	assessment
	Participant 3: So you're kind of **practicing as you're going along** for your OSCEs and that's our main **practical assessment** that we have.	OSCEs (assessment) = practice as students progress	assessment
	participant 3: Then also you have our standard module **exam** system.	exam	theory assessed
	Participant 3: So yeah.	agrees	
	Participant 1: And module exams help us **bring information that we've learned** throughout the whole year **together.**	exams help bring together learning	link theory and practice

Focus group of forensic science students.

Does the assessment help you develop your professional practice skills?	Participant 1: Um, it **depends on the assessment**. Exams test our knowledge but don't really help us **practically,** with different modules test our practical skills which will help us in the professional workplace.	depends on assessment	practice and assessment
So when you do exams do they test different kinds of knowledge from the other kind of assessment that you do?	Participant 2: Um, it's similar but in different ways, like **they could test our practical stuff** like when we actually do it but if they test the way it's just written cause some people could find it hard to put down into words while it can quite easily show, physically.	test practice knowledge	practical knowledge
Is it that you are telling me the exams are more theoretical?	Participant 2: Yeah	exams theoretical	exams theoretical
What do other people think?	Participant 3: No, I think that's accurate, a lot of stuff during **exams is theorized**. So for example, this module we have lab reports to write. Lab reports more of how it's your ability to **research,** how well you can **analyze** data you're given. Whereas there are questions in the exam where you have a set data and you have to go through it but there is much more of that involved in lab reports, more than you know.	exams theory-based, lab reports research	exams test theory

Interview with built environment tutor.

What do you consider assessment feedback to be?	An assessment is a means of **checking that student learning** is taking place and that they have sufficient **knowledge** and understanding,	checking **learning** is taking place, students have knowledge	learning
	so you satisfy the **learning outcomes** of each module, that's assessment.	satisfy ILOs	ILOs
	Feedback is could mean a whole **range of things.**	feedback = a range of things	feedback diverse
	In my opinion, it's basically to **provide students** with an idea of the **progression they are making on the module,**	give students idea of how they are progressing	learning
	satisfying the **learning outcomes** and satisfying the **content of the module.**	satisfy IOLs & module content	ILOs & content

Interview with forensic science tutor.

1 What influences you when you design assessed coursework and why?	Mostly their **skills** really. So, it could be presentation, we could give them **assignment in form of presentation**	skills and assessment	skills
	We try to make them as **practical** as possible.	practical assessment	practical
	Yeah. To **develop most of their skills**, as obviously you need to **test their knowledge** as well, but we do take into consideration quite a lot of skills they get.	develop skills and test knowledge	skills

Interview with optometry tutor

1 What influences you when you design assessment coursework and why?	It's an open question. We **don't have that many coursework assessments** in the modules that I teach.	not many cousework assessments	assessment
	We have **clinical assessments** and written assessments in some of the assessments. I've been particularly involved with developing the **clinical assessments**.	clinical assessments	practice-based assessment
	Our professional regulator, the **General Optical Council**, sets a number of **competencies** which have to be achieved by our students during their undergraduate study, and then an additional set that need to be achieved after they finish and before they are fully qualified.	GOC, competencies	practice-based assessment
	In teaching clinical subjects, I need to make sure that the **clinical skills** that we are teaching the students are **appropriate** for the regulatory body requirements,	skills	skills - practice-based
	and in setting the assessments for first, second, and third year, I want to make sure that the students are **progressing** with their **clinical skills**	progressing clinical skills	developing practice-based skills
	and achieving the standard that has been set by our regulatory body.	PSRB competencies	competencies

Interview with employer

Do you think that undergraduates link university work with professional practice?	**No** [emphatic]	students not link uni work with pp	linking theory with practice
Can you expand on that?	Yes, of course, I can, yeah. It would be very useful if at least some reference or link to the **RICS APC process**, uh, could be **merged into the structure of their modules**.	need to link with APC more	use APC structure
	Because, uh, then it would at least give them some need to **record** information and **experience,** based on what they're **learning** and indeed, um, **applying** that knowledge and education as well.	would record information	record experience
	Obviously there's going to be various reasons why **they can't link what they're learning to working.**	cannot link theory and pp	cannot link theory and practice
	Some **might not have access** to that,	student access	access an issue
	but the ones that do should be **applying** that for the APC style of recording experience.	should record experience	professional experience
	Learning then applying, and then informing or advising along the **APC** structure.	learn and apply, use APC structure	apply learning

CIOB PSRB documentation

Understand and **describe** the principles of: • macro and micro **economics** • supply and demand • market structure and operation • **finance** for construction activities • cash flow • price and cost estimation for **construction activities**	understand and describe economics, finance& construction activities	understand & describe
Compare, appraise and select different **procurement** processes for construction activity.	appriase, select, procurement	thinking skills
Produce examples of price and cost estimation for **construction** activities.	produce	produce

RICS PSRB documentation

• **Communication** and negotiation	communication	communication
Communication and negotiation	communication	communication
Conflict avoidance, management and dispute resolution procedures	communication	communication
Provide evidence of **practical application** of oral, written, graphic and presentation skills that are appropriate in a variety of situations, specifically including where negotiation is involved.	communication - application	communcation

CSF PSRB documentation

Describe the **context** in which the process of construction operates, including legal, business, social, economic, cultural,	context	context
equality and inclusion, technological, physical, environmental and global influences;	context	context
Appreciate the importance of **sustainability** within the built environment and its creation and endurance;	sustainability	sustainability
* Understand the importance of **health, safety** and wellbeing within the construction context, including the demonstration of good practice in the application of health and safety legislation;	H&S	H&S
* **Recognise, understand** and **apply** sound construction technology principles;	knowledge learning apply	real world

Built environment module guide

To **identify** the following:	identify	knowledge
1. Stakeholders and their involvement with the **project** and any **impact** they may have on it	project and impact	project impact
2. **Current issues** in the built environment (for example, sustainable construction)	current issues	current
3. Analysis of the **key elements** that affect the **decision making** processes	key elements, decision making	decision-making
4. How **professional ethics** may affect the running of a **project**	profesional ethics, project	real world

Forensic science module guide

This module is designed to provide students with **knowledge** and **experience** of	knowledge, experience	know experience
(i) **analysing** "real" forensic science samples using a variety of chromatographic and spectroscopic techniques and (ii) an **understanding** of the underlying quality management principles that are involved in such analyses.	analyse understand	analyse (higher level)
The **choice** of analytical method, the results so generated and their **interpretation** are central to this module. Examples will be drawn from the forensic sciences.	interpret	interpret

Built environment feedback

various aspects of **adjudication** covered well along with **comparisions** to other dispute resolution methods ands the useage	adjudication, real world	real world

Some good details here, but this could have been more clearly **presented,** with specifics of the plan required, e.g. what type of crane would you suggest?	presentation	communication
You have covered the key elements here, but also far too much more! Be specific about the **task you are covering** so no need for harnesses or temperature extremes.	task	thinking
A fair **structure** overall, but there is no need to tell me what this method does in general terms – remember the function of the RAMS.	structure	communcation
Good use of a template for the RA.		

Optometry dissertation feedback

Punctuation needed to be accurate e.g. its x, it's ✓	punctuation	communication
Grammar needed attention as well, some of the sentence construction was poor/confusing.	grammar	communication
The combination of poor punctuation and grammar made reading the dissertation really hard work. A little more attention to basic punctuation and grammar would have made the content much **easier to follow** the content.	easy to follow	communication